

American Aviation

The Independent
Voice of
American Aeronautics

20c
A Copy

Vol. 6, No. 1

JUNE 1, 1942

Published Twice a Month at Washington, D. C.



'Our Aim'

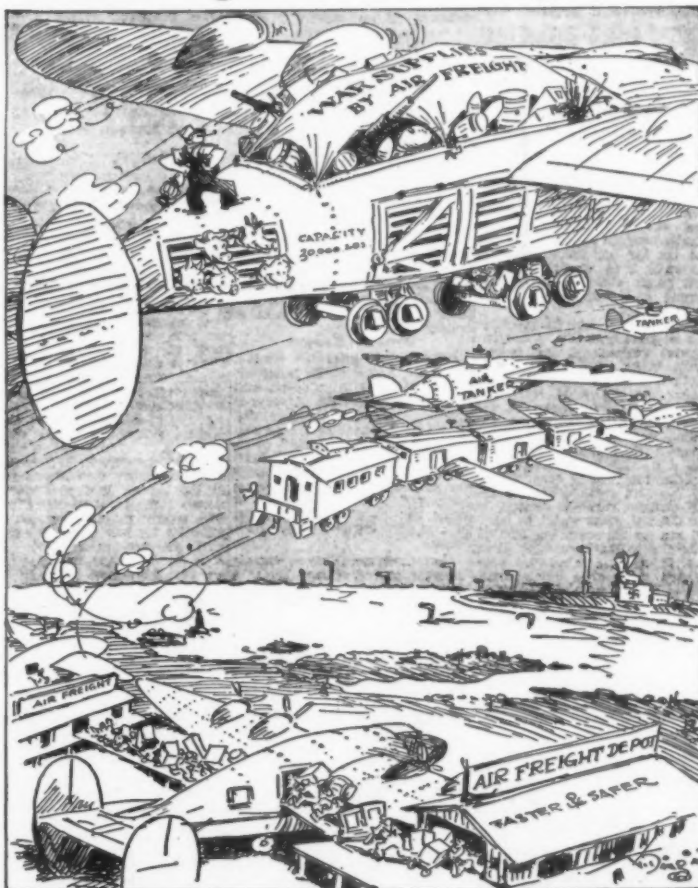
AMERICAN AVIATION is now five years old.

On this fifth anniversary we regain the title of our first editorial, "Our Aim" and reprint a few sentences outlining the goal to which we aspired: "AMERICAN AVIATION is a fortnightly publication ambitious to serve aviation's public throughout the Americas with complete news service and constructive editorial comment. We believe the advance of aviation during the next decade will bring more changes in world business and living modes than have been brought about by railroad development during the past half century in the U. S. We shall gear this magazine to this rapid change."

Today we reaffirm our purpose as stated half a decade ago, knowing better what those words mean. We have known "sweat and tears" and perhaps have only avoided some "blood letting" because of our youthful agility. We have been a service part of the promising new aviation industry as it turned suddenly from the plans of peace to accelerate its growth and expansion wholly a force in war. We started when aircraft manufacturers had a total annual business of approximately \$115,000,000 and today we are providing a news service to an industry building airpower to the tune of approximately 20 thousand (Turn to page 34)

Domestic Airlines Placed on War Basis; Commercial Service Cut

Air Cargo to the Warfronts



'Betcha We Could Do It If We Tried,' Says Cartoonist
With Airlines' Help, Army Strives to Attain This Goal

Fifth Anniversary Issue

Companies Retain Identities; Some Routes Curtailed

By WAYNE W. PARRISH

THE NATION'S domestic airlines were placed on stringent war-time footing May 15 as an acute shortage of transport airplanes among the United Nations made necessary a sharp curtailment of commercial air services.

Not later than June 1 no more than 165 commercial transport airplanes will be operating a skeletonized service for mail, express and passengers in place of the more than 350 planes in service this time a year ago. The government emphasized that further requisitioning of transport planes for the war effort may be necessary for the critical war period for the remainder of this year.

The Civil Aeronautics Board on May 21 released the new U. S. airline map showing a reduction of about 45% in daily airplane miles of the nation's scheduled airline services.

Suspension of short routes and local services, and retention of important long-haul schedules accounted for the fact that the reduction totaled only 45% in daily miles to be

(Turn to page 28)

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"ACHIEVEMENT" by John Hammer

BRAIN CHILD—GROWN UP! . . . To the cause of an allied victory, Republic Aviation engineers have contributed a powerful aid. The swift and timely evolution of the phenomenal *P-47 THUNDERBOLT*—world's biggest, toughest interceptor—from original design to large-scale production, is a worthy example of the brilliant record of American engineering genius in this war. *Republic Aviation Corp., Farmingdale, L. I., N. Y.*



REPUBLIC AVIATION

Sailplane Manufacturers Anticipating Vast Expansion for War and Post War

Huge Orders For Military Gliders Reported

OVERSHADOWED up to now by its big brother in the aircraft industry, sailplane manufacturing is apparently on the verge of vast expansion in the war effort and subsequently in the post-war period promises to play an important role in air transportation and freight.

These prospects are centering attention of pioneers of the sailplane industry who until recently confined activities to producing gliders or sailplanes for sport, a sport that has been described as affording all the thrills of skiing without risking broken legs.

While details, due to military secrecy, are omitted, the possible scope of the military glider program is somewhat indicated by the Navy's recent announcement that it is buying large troop carrying gliders. The Army has announced similar intentions. Still larger contracts have been held in secrecy.

The government's idea is to utilize as far as possible existing wood-working facilities of furniture, piano, and aircraft frame manufacturers in subcontracting work supervised by trained glider craftsmen.

Although for the duration of the war, emphasis will be entirely on meeting whatever demands come from the armed services, observers nevertheless foresee the sailplane industry as an important adjunct of the aircraft manufacturing and the air transport industries in the post-war era.

Already developments in the war have shown the practicability of the use of gliders in transporting freight and passengers.

Planes of the Douglas DC-3 type, in addition to carrying close to their full payload, it is stated, can each haul three to four gliders or sailplanes of 6,000 to 8,000 lbs. gross at 125 mph.

On transcontinental runs, gliders destined for inter-route cities could be cut loose and they also could be picked up by special devices.

Somewhat like a tugboat, powered planes can do more towing than direct cargo carrying and at a rela-

tively small sacrifice in speed.

After freight towing developments, passenger gliders free from vibration, noise, or fire hazard loom as the next possible innovation. The economic significance of such possibilities is indicated in estimates that gliders will cost a fourth or a third of what an air transport costs.

The sport angle will also provide a growing demand for sailplanes, stimulated by the interest in aviation developed during the war. Sailplanes may be used anywhere trailers can haul them and the probability, according to Hawley Bowlus who started building gliders 20 years ago, is that the post-war period will see numerous glider clubs throughout the country.

Admiral Towers Heads New Navy Aviation Agency

RECOGNIZING the increased importance of aviation in Naval activities, the Navy Dept. last fortnight announced that Rear Adm. John H. Towers, chief of the Bureau of Aeronautics, had been named Assistant Chief of Naval Operations (Air).



Adm. Towers

This new agency, the announcement explained, will handle "all appropriate and duly assigned matters relating to Naval aviation."

The agency is responsible directly to the Vice-Chief of Naval Operations. In addition to his new duties, Adm. Towers continues to serve as chief of the Bureau of Aeronautics.

It Was Doolittle

Brig. Gen. James H. Doolittle was awarded the Congressional Medal of Honor on May 19 for having led "a squadron of Army bombers manned by volunteer crews in a highly destructive raid on the Japanese mainland." The raid was that of Apr. 18.

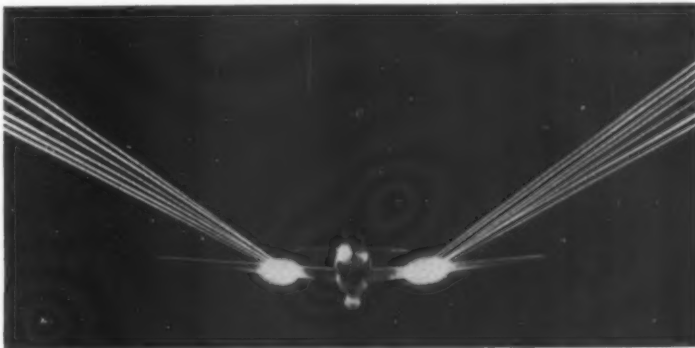
Following the raid, Doolittle was promoted from Lieutenant Colonel to his present rank.

Cessna One of 3 Major Concerns to Build Gliders

REVEALING that Cessna Aircraft Co. of Wichita, Kan., is one of three major aircraft concerns to which glider construction contracts have been awarded, Dwane Wallace, president, said in mid-May that his company is ready to embark on a "gigantic glider construction program, and new equipment is already being moved into the new plant" erected in 30 work days at Hutchinson, Kan.

The announcement was made with the approval of the War. Dept., but the size of the plant and numbers to be employed are wartime secrets.

"Announced on Tuesday, staked out on Wednesday, foundations dug Thursday, forms built Friday, concrete poured Saturday"—construction of the new Cessna unit was speeding along at a fast clip, according to company statements.



As Seen by the Enemy: The Curtiss P-40E, immediate predecessor of the AAF's new Warhawk fighter, engaged in night gunnery tests recently on the new Curtiss-Wright firing range in Buffalo. The photo has been retouched slightly to show how the fighter might appear to an enemy at night, attacking head-on with all guns ablaze. The tracer bullets actually converge in front of the plane but the angle of the camera gives the impression that they diverge.

Price Change

Effective with this issue, the single copy price of **AMERICAN AVIATION** becomes 20c. There is no change in subscription rates.

Aviation Grows In Five Years

Has aviation grown in five years?

As this issue went to press—**AMERICAN AVIATION**'s fifth anniversary issue—the editors turned to the files to see what was happening on June 1, 1937, when Vol. 1 No. 1 went to press.

The first issue disclosed:

● Douglas Aircraft Co. had new orders for the tremendous sum of \$30,000,000, had 6,700 employees, planned to have 10,000 by Jan. 1, 1938.

● Pan American Airways and Imperial Airways were making proving flights, preliminary to early establishment of regular service between New York and Bermuda.

● The Post Office Dept. was advertising for bids on the following air mail routes: (1) Washington-Buffalo, (2) Winslow-San Francisco, (3) Dayton-Chicago, and (4) Huron-Cheyenne.

● Douglas Aircraft had just released size and performance data on the DC-4.

● United Air Lines on May 15, 1937, had placed Denver on its transcontinental route.

● The Post Office Dept. had approved purchase of National Parks Airways by Western Air Express. NPA operated Salt Lake City-Great Falls.

● Vultee division of Aviation Manufacturing Corp., with foreign orders totaling between \$3,500,000 and \$4,000,000, had enough work on hand to keep the factory busy for the balance of the year.

● The Sikorsky division of United Aircraft Corp. had been awarded a big Navy contract for \$1,960,790 worth of amphibian transports.

The first issue of **AMERICAN AVIATION** consisted of 20 pages. This fifth anniversary issue totals 54 pages.

New Training Units Planned by Air Forces

CONSTRUCTION has been approved for eight more new Air Forces training schools to cost more than \$25,000,000 and four Air Force installations to cost more than \$12,000,000.

The schools will be built at Newport, Ark.; Stuttgart, Ark.; Boca Raton, Fla.; Bainbridge, Ga.; Greenwood, Miss.; Sedalia near Knobnoster, Mo.; Childress, Tex. and San Marcos, Tex.

The installations, which will be used for purposes other than schools, are located at Pocatello, Ida.; Salina, Kan.; Great Falls, Mont.; and Casper, Wyo.

Italian Warplane Specifications Revealed

Official Release Reviews Twelve Enemy Types

TWELVE types of Italian military aircraft are analyzed in an official release of

the U. S. Army Air Forces and the British Air Ministry.

Both fighters and bombers are covered in the release, the first one to be issued to the public on enemy planes.

AMERICAN AVIATION for May 1 and May 15 reviewed Japanese and German equipment.

The official data follows:

Italian Warplanes

DESIGNATION CANT Z1007 (Bis) Long-range Bomber. (Pictured below)

DIMENSIONS Span 81 ft., 4 in. Length 60 ft. Height 18 ft., 6 in. Wing area 740 sq. ft. net.

DUTY Long range bombing.

CREW 4 or 5.

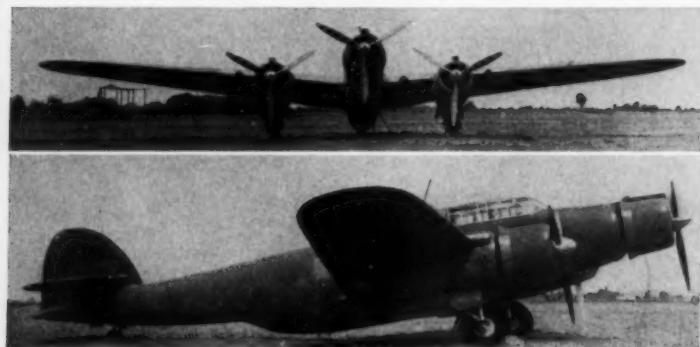
GENERAL DESCRIPTION Three engine, mid-wing, cantilever monoplane of all-wood construction. The fuselage is of wooden semi-monocoque construction covered with plywood skin. Tail unit of strut-braced monoplane type with single fin and rudder. The undercarriage retracts rearwards into engine nacelles.

ENGINES Three Piaggio P.XI. RC40 14-cylinder, two-bank, air-cooled radials. 1,000 h.p. at 13,000 ft.

ARMAMENT 1 x 12.7 mm. gun in dorsal turret. 1 x 12.7 mm. gun ventral. 2 x 7.7 mm. guns lateral.

PERFORMANCE Normal flying weight 28,600 lb. Maximum speed 280 m.p.h. at 15,000 ft. Cruising speed 235 m.p.h. at 15,000 ft. Service ceiling 26,500 ft. Range 800 miles. Endurance 3.4 hours. Fuel tankage 580 gallons. Bomb load 2,600 lb.

There is a seaplane version of this aircraft adapted to carry two torpedoes of 1,000 kg. each.



Official Photograph, U. S. Army Air Corps

Cant Z1007 Bomber Wooden Fuselage Is Covered With Plywood Skin

DESIGNATION MERIDIONALI Ro 43 Floatplane.

DIMENSIONS Span 38 ft. Length 32 ft. Height 11 ft., 6 in. Wing area 358 sq. ft.

DUTY Naval fighter, reconnaissance, catapult seaplane.

CREW 2.

GENERAL DESCRIPTION Single-engine, folding wing-biplane of unequal span. Mixed construction. Fuselage of steel tube construction covered partly with sheet metal and partly fabric. Single fin and rudder.

FLOATS One single-step central float attached to the fuselage by struts, and two stabilizing floats mounted under the wing tips. All of wooden construction.

ENGINE One Piaggio "Stella" XRC air-cooled radial. 700 h.p. at 3,000 ft.

ARMAMENT 1 x 7.7 mm. forward fuselage. 1 x 7.7 mm. dorsal.

PERFORMANCE Normal flying weight 5,400 lb. Maximum speed 186 m.p.h. at 8,000 ft. Cruising speed 155 m.p.h. at 6,500 ft. Service ceiling 26,000 ft. Range 440 miles. Endurance 2.8 hours. Fuel tankage 87 gallons.

NOTE: A development of the Ro43, known as the Ro44, has no observer's cockpit or equipment. The service ceiling of this aircraft is 28,000 ft., the normal flying weight 4,900 lb. and the fuel tankage 62 gallons.

DESIGNATION CAPRONI Ca 312 (bis) Floatplane.

DIMENSIONS Span 53 ft. Length 44 ft. Wing area 418 sq. ft.

DUTY Torpedo carrying and reconnaissance.

CREW 3.

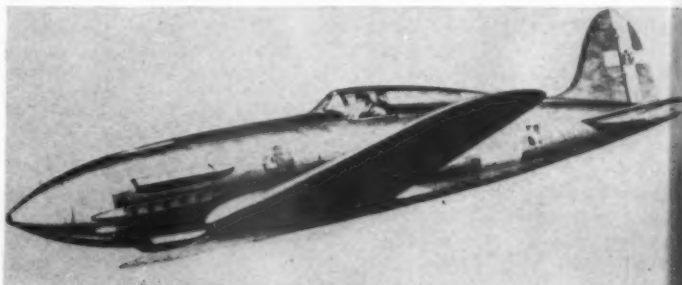
GENERAL DESCRIPTION Low-wing cantilever-monoplane of mixed construction. The wing structure is of wood with plywood covering. The fuselage is a steel tube structure and is fabric covered. Tail unit is cantilever monoplane type.

FLOATS Two long, single-step, metal.

ENGINES Two Piaggio P.XVI.RC35 9-cylinder, air-cooled, radial. 650

ARMAMENT PERFORMANCE

h.p. at 11,500 ft.
2 x 7.7 mm. in wings. 1 x 7.7 mm. dorsal. 1 x 7.7 mm. ventral.
Normal flying weight 12,800 lb. Maximum speed 230 m.p.h. at 13,000 ft. Cruising speed 195 m.p.h. at 13,000 ft. Service ceiling 23,000 ft. Range as reconnaissance aircraft 1,000 miles. Endurance 5.15 hours. Fuel tankage 350 gallons. Range as bomber 220 miles. Endurance 1.14 hours. Fuel tankage 115 gallons. Bomb load 1,700 lb. or one torpedo.



Official Photograph, U. S. Army Air Corps

Macchi C202 Fighter Maximum Speed is 330 MPH at 18,000 Ft.

DESIGNATION MACCHI C. 202 Fighter. (Pictured above)

DIMENSIONS Span 35 ft. Length 20 ft., 5 in.

DUTY Fighting.

CREW 1.

GENERAL DESCRIPTION This aircraft is a development of the Macchi 200 and is of cleaner aerodynamic design.

ENGINE DB6C1N. 1,200 h.p. at 16,000 ft.

ARMAMENT 2 x 12.7 mm. forward fuselage firing through the airscrew duct.

ARMOR Pilot's seat fully protected, thickness 8 mm.

PERFORMANCE Normal flying weight 6,300 lb. Maximum speed about 330 m.p.h. at 18,000 ft. Cruising speed 300 m.p.h. at 18,000 ft. Service ceiling about 34,000 ft.

DESIGNATION BREDA Br88 Fighter-Bomber.

DIMENSIONS Span 51 ft. Length 38 ft. Wing area 358 sq. ft. net.

DUTY Fighter-Bomber, ground attack or reconnaissance.

CREW 3.

GENERAL DESCRIPTION Twin-engine, high performance, shoulder-wing cantilever monoplane. Wings and fuselage of metal construction covered with metal skin. Slotted ailerons and flaps. Handley Page auto-slots in front of aileron. Fuselage of oval section. Tail unit cantilever with twin fins and rudder. Undercarriage retracts rearwards into engine nacelles.

ENGINES Two Piaggio P.XI.RC40 14-cylinder, air-cooled two-bank radials.

AIRSCREWS Three-bladed V. P.

ARMAMENT 3 x 12.7 mm. forward fuselage. 2 x 7.7 mm. in wings.

PERFORMANCE Normal flying weight 14,700 lb. Maximum speed 310 m.p.h. at 13,500 ft. Service ceiling 28,500 ft. Range 900 miles. Endurance 3.38 hours. Fuel tankage 350 gallons. Range (overload fuel) 1,450 miles at economical speed of 185 m.p.h. Cruising speed 265 m.p.h. at 13,500 ft.



Official Photograph, U. S. Army Air Corps

Fiat CR42 Fighter 840 HP at 12,500 Ft.

DESIGNATION FIAT CR42 (Fighter). (Pictured above)

GENERAL DIMENSIONS Span 32 ft. Length 27 ft. Height 11 ft. Wing area 237 sq. ft. gross.

DUTY Fighting.

CREW 1.

GENERAL DESCRIPTION Single-seater fighter biplane of unequal span. The wings have no taper. Single-leg fixed undercarriage. No flaps are fitted.

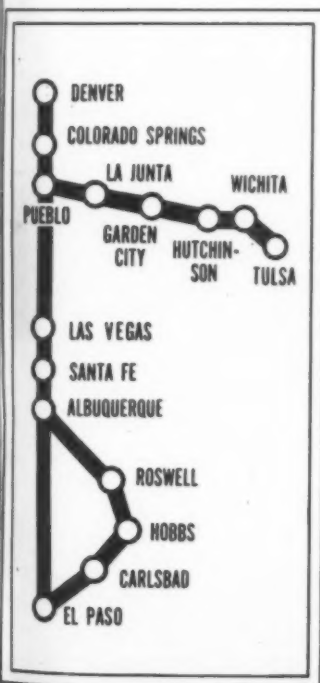
ENGINE Fiat A74RC38 air-cooled 14-cylinder, radial. 840 h.p. at 12,500 ft.

AIRSCREW Metal three-bladed V. P.

(Turn to page 6)



GEORGE ELLIS *said* *something...*



There's a fellow who works for us—let's call him George Ellis—who is taking this war mighty seriously, as we all are.

George's job keeps him overtime consistently, and his three children are not always an unadulterated joy. But somehow George includes War bonds, Victory garden, scrap metal collections and newscasts in his daily schedule.

And George said something recently that made us think. "It seems to me," he said, "that this war is doing something good. It's making us work with and appreciate the other fellow. British and Russians. Australians and Egyptians. Americans and Chinese. But it comes



closer home than that. In booking space for war travelers I work a lot with other airlines' reservations men. It seems to me the airlines are operating more like a single outfit than like 17 different companies. And what's more, every man I've worked with has been more interested in getting important passengers through than in getting home to meals or out on a

date. We all believe our jobs are important to war work, and we're giving them all we've got." George typifies the spirit in Continental Air Lines. We know the importance of providing time-saving transportation throughout the west. And we're giving the job "all we've got"!

Italian Bombers and Fighters

(Continued from page 4)

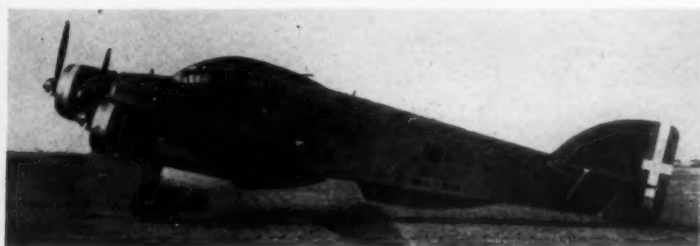
ARMAMENT 1 x 7.7 mm. or 2 x 12.7 mm. forward fuselage. 1 x 12.7 mm. firing through the airscrew disc.
PERFORMANCE Normal flying weight 5,100 lb. Maximum speed 270 m.p.h. at 13,000 ft. Cruising speed 232 m.p.h. at 13,000 ft. Service ceiling 31,000 ft. Range 460 miles. Endurance 1.95 hours. Fuel tankage 92 gallons.



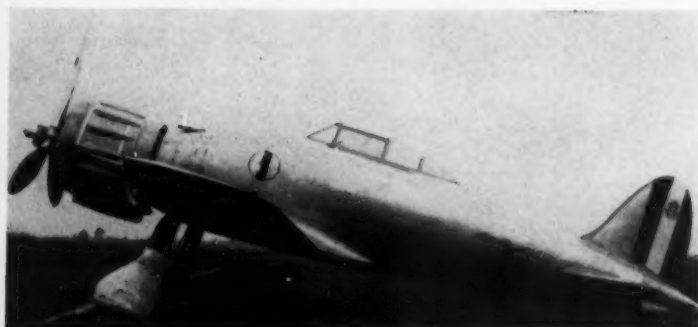
Piaggio P32 Bomber
Carries Bomb Load of 2,200 Lbs.



Fiat BR20 Bomber
Endurance Is 5.2 Hrs.



Savoia-Marchetti SM79 Bomber
Also Used for Torpedo Dropping



Macchi C200 Fighter
Maximum Speed 305 MPH at 15,000 Ft.

DESIGNATION PIAGGIO P32 (bis) Bomber. (Pictured on left)
DIMENSIONS Span 59 ft. Length 53 ft. Height 19 ft. Wing area 635 sq. ft. gross.
DUTY CREW 4.
GENERAL DESCRIPTION Mid-wing, cantilever-monoplane of wooden construction, covered with plywood. Ailerons and flaps have metal frames with fabric covering. Fuselage of oval section with stressed plywood skin. Tail unit of cantilever monoplane type with twin fins and rudders. Undercarriage retracts rearwards into engine nacelles.
ENGINES Two Piaggio P.XI.RC40 14-cylinder, air-cooled, two-bank radial, 1,000 h.p. at 13,000 ft.
ARMAMENT 1 x 7.7 mm. forward fuselage. 2 x 12.7 mm. dorsal. 2 x 12.7 mm. ventral.
PERFORMANCE Normal flying weight 22,000 lb. Maximum speed 260 m.p.h. at 15,000 ft. Cruising speed 220 m.p.h. at 13,000 ft. Service ceiling 20,000 ft. Range 1,100 miles. Endurance 5 hours. Fuel tankage 520 gallons. Bomb load 2,200 lb. Overload bombs 3,500 lb. Range with overload fuel 2,750 miles at economical speed of 210 m.p.h. at 13,000 ft. (no bomb load).

DESIGNATION FIAT Br20 (bis) Bomber. (Pictured on left)
DIMENSIONS Span 71 ft. Length 52 ft. 9 in. Height 14 ft. Wing area 710 sq. ft. net.
DUTY CREW 3 to 6.
GENERAL DESCRIPTION Low-wing, cantilever, monoplane of metal construction. Fitted with split flaps and balanced aileron with trimming tabs. Fuselage of rectangular structure with rounded corners. Tail unit of cantilever monoplane type with twin fins and rudders. Undercarriage retractable rearwards into engine nacelles.
ENGINES Two Fiat A80RC41 14-cylinder, two bank, air-cooled radial, 1,000 h.p. at 13,000 ft.
ARMAMENT 1 x 7.7 mm. forward fuselage. 1 x 12.7 mm. dorsal. 1 x 7.7 mm. ventral.
PERFORMANCE Normal flying weight 22,500 lb. Maximum speed 255 m.p.h. at 13,000 ft. Cruising speed 220 m.p.h. at 13,000 ft. Service ceiling 25,000 ft. Range 1,150 miles. Endurance 5.2 hours. Fuel tankage 340 gallons. Bomb load 2,200 lb.

DESIGNATION SAVOIA-MARCHETTI SM79 Bomber. (Pictured on left)
DIMENSIONS Span 69 ft. 5 in. Length 53 ft. Height 15 ft. 2 in. Wing area 667 sq. ft. net.
DUTY CREW Bombing, reconnaissance, torpedo dropping.
GENERAL DESCRIPTION 4 or 5.
GENERAL DESCRIPTION Low-wing, cantilever, monoplane of mixed construction. Entire trailing edge of wings from tips to engine mountings is hinged, the inner sections acting as camber-changing flaps and the outer sections as ailerons or flaps. Handley Page slots on leading edges. Fuselage of welded steel construction covered partly sheet-metal and partly plywood. Tail unit of monoplane type covered fabric. Undercarriage retracts rearwards into engine nacelles.
ENGINES Three Alfa-Romeo 126RC34 9-cylinder air cooled radial, 700 h.p. at 11,500 ft.
AIRSCREWS Three bladed V. P.
ARMAMENT 1 x 12.7 mm. forward fuselage. 1 x 12.7 mm. rear fuselage. 1 x 12.7 mm. ventral aft. 1 x 7.9 mm. ventral forward.
ARMOR A plate of 9.5 mm. thickness is fitted behind the pilot and in some cases the fuel tanks are also protected.
PERFORMANCE Normal flying weight 22,400 lb. Maximum speed 260 m.p.h. at 11,500 ft. Cruising speed 225 m.p.h. at 11,500 ft. Service ceiling 23,000 ft. Range 1,000 miles. Endurance 4.5 hours. Fuel tankage 560 gallons. Bomb load 2,200 lb. Two torpedoes can be carried under the fuselage.

DESIGNATION MACCHI C. 200 Fighter. (Pictured on left)
DIMENSIONS Span 35 ft. Length 27 ft. Height 11 ft. 6 in. Wing area 161 sq. ft. net.
DUTY CREW 1.
GENERAL DESCRIPTION Fighting.
GENERAL DESCRIPTION Low-wing, cantilever-monoplane. Fuselage oval section metal monocoque. Undercarriage retracts inwards into fuselage. Retractable tailwheel. Cantilever tail unit having single fin and rudder. Trailing edge flaps.
ENGINE Fiat A74RC38. 840 h.p. at 12,500 ft.
ARMAMENT 2 x 12.7 mm. forward fuselage, firing through airscrew disc. 2 x 7.7 mm. in wings.
PERFORMANCE Normal flying weight 4,850 lb. Maximum speed 305 m.p.h. at 15,000 ft. Cruising speed 265 m.p.h. at 15,000 ft. Service ceiling 33,000 ft. Range 280 miles. Endurance 1.05 hours. Fuel tankage 57 gallons. Range (overload fuel) 1,000 miles at economical speed of 170 m.p.h. at 15,000 ft.

DESIGNATION CANT Z506B Floatplane.
DIMENSIONS Span 87 ft. Length 63 ft. Wing area 936 sq. ft.
DUTY CREW Bombing and reconnaissance.
GENERAL DESCRIPTION 4 to 5.
GENERAL DESCRIPTION Three engined, mid-wing-monoplane, having a pronounced dihedral and a slight sweep back to the leading edge. Details of construction not known.
ENGINES Three Alfa-Romeo 126RC34 9-cylinder air-cooled radial, 700 h.p.

(Turn to page 9)

Air Forces Looks Ahead To Increased Glider Activity

LIGHT airplane and glider schools are being established in various parts of the U. S., chiefly in the Middle West, to train Army Air Forces glider pilots. Men from 18 to 35 years of age who have had training as civilian pilots and who have been ineligible for aviation cadet training may qualify as glider pilots under the Air Forces program.

Glider pilot candidates will first receive instruction in light aircraft and then will go into small gliders and later larger types of gliders. The light airplane instruction is to be given by CPTP schools of the CAA. Glider instruction will be given at additional Army glider schools.

A feature of the light airplane instruction program will be that all landings will be "dead stick" with power off. In this respect, the landings will simulate those made in gliders. Students will make dead stick landings from various altitudes and angles until they attain maximum efficiency in precision, power-off landings. This will prepare them for one of the more difficult features of the glider training to follow.

Applicants must pass the physical examination prescribed for aviation cadet applicants and vision must be at least 20/40, correctible to 20/20. No one who has been eliminated for flying deficiency from primary pilot training in the Army, Navy, or CPT

flight schools will be eligible.

To qualify for this training, applicants must have been graduated from the CPT elementary course or must hold a CAA private airman certificate or higher. The applicant, however, may also qualify by submitting evidence that he has participated in at least 200 glider flights.

If the applicant is a civilian, he must pass the Army general classification test and obtain a score of 110 or better. Civilian applicants will be placed in the Army Air Forces enlisted reserve and assigned to the training course. Men in the military service who have not taken the classification test will be required to do so. Officers also are eligible, without classification test, but must conform to requirements regarding private pilot certificate, as above.

Students who completed the glider course will be promoted to grade of staff sergeant, given the rating of glider pilot and assigned to active duty. All who successfully complete the glider course will be given flight pay.

The preliminary lightplane instruction, it was pointed out, will not be a flying training course for beginners, but will serve as a "refresher" course for pilots already holding certificates but who have not kept up their flying recently, and will serve as a precision landing course for all students.

Transport Airmen Wanted by Navy

THE NAVY DEPT. announces that billets are waiting for a limited number of men who are trained in various phases of scheduled air transport work.

A new division of the "specialist" rating, to be designated by the letter "V", has been established for transport airmen, and men who are qualified may enlist in petty officer or chief petty officer ratings, Chief Specialist (V) or specialist first, second, or third class, depending on their experience.

Men who are acceptable will be assigned to the Naval Air Transport Service, which was organized early this year for the purpose of providing scheduled air transportation for Navy personnel and cargo in connection with Naval activities.

Applicants must have wide experience in operation of airports, servicing and loading of planes, officials said.

Gliding Leathernecks

Officers and men of the Marine Corps have been training in aerial and ground glider operations since the summer of 1941, it has been disclosed. Lt. Col. V. M. Guymon is commanding officer of the gliding group based at Parris Island, S. C. Marine Corps headquarters report few accidents and no fatalities in glider operations to date.

Second Pre-Flight Unit Opened by Navy

SECOND of the Navy's pre-flight indoctrination schools to be put into operation is the new training center at the University of North Carolina, Chapel Hill, N. C., which was formally commissioned May 23. Comdr. Oliver O. Kessing is commanding officer of the new school.

The University of North Carolina training school will be the eastern center of the Navy's vast new program designed to train 30,000 pilots annually. Three other pre-flight "toughening" schools, at the University of Georgia, Athens; the University of Iowa, Iowa City; and St. Mary's College, St. Mary's College, Cal., will cover, respectively the southern, Middle West and Pacific coast areas of the country.

The entering class of 600 cadets which have arrived at the North Carolina center will be followed by the same number on June 28 and July 28.

New Navy Air Command

Rear Adm. Arthur B. Cook, former chief of the Bureau of Aeronautics, has been designated chief of air operational training, a newly formed command, with headquarters at Naval Air Station, Jacksonville, Fla. Cook has been on temporary duty in the Bureau of Aeronautics since he was recently relieved of command of a task force of the Atlantic Fleet.

Lombard Heads WPB's Aircraft Scheduling Unit

DR. A. E. LOMBARD, Jr. has been appointed administrator of the War Production Board's aircraft scheduling unit, located at Dayton, O., according to Merrill Meigs, chief of the Aircraft Branch.

The unit represents WPB, Army, and Navy in the joint control of detail scheduling of raw materials, equipment and machine tools to the aircraft industry.

Col. E. M. Powers, Army Air Forces; Capt. Donald R. Royce, Navy Bureau of Aeronautics; and Col. W. S. Cave, British Air Commission, represent their respective services, while T. H. Lowry, V. N. Agather, and R. F. Williams continue their administrative duties under Dr. Lombard.

Cheap Cargo Service

On completion of the recent 30-day experiment in courier service performed for the Army Air Forces by the Pennsylvania Wing of the Civil Air Patrol, the average cost of cargo carried was computed at approximately \$0.001 per pound mile—or about 10c to carry one pound 100 miles.

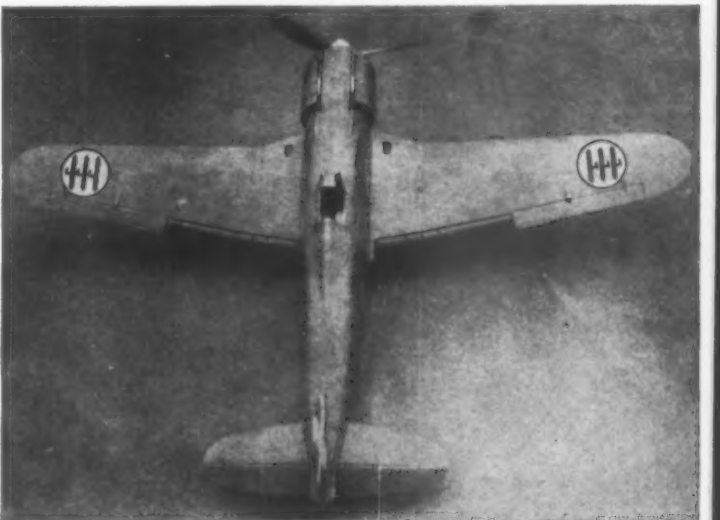
The appointments have been made in view of the increased scope and responsibilities of the unit, according to WPB.

In addition, Dr. Lombard will remain as chairman of the subcommittee on the allocation of deliveries of the Joint Aircraft Committee. A. O. Pierrot, formerly his assistant, will take over detailed scheduling of aircraft, engines and propellers.

Italian Warplanes

(Continued from page 6)

FLOATS	h.p. at 11,500 ft.
ARMAMENT	Two.
PERFORMANCE	1 x 12.7 mm. gun dorsal. 1 x 12.7 mm. gun ventral.
	Normal flying weight 26,400 lb. Maximum speed 230 m.p.h. at 13,000 ft. Cruising speed 195 m.p.h. at 13,000 ft. Service ceiling 24,000 ft. Range 1,000 miles. Endurance 5 hours. Fuel tankage 590 gallons. Bomb load 2,200 lb.
DESIGNATION	FIAT G50 (Fighter). (Pictured below)
GENERAL	Span 35 ft., 9 in. Length 25 ft., 6 in. Height 9 ft., 3 in. Wing
DIMENSIONS	Area 196 sq. ft. gross.
DUTY	Fighting.
CREW	1.
GENERAL	Low-wing, cantilever monoplane, the wings having a straight
DESCRIPTION	leading edge and rounded tips. The undercarriage retracts inwards into the fuselage. Tailwheel fixed. Trailing edge flaps are fitted. Fuselage is of circular section forward, changing to elliptical section at the cockpit. Covered stressed-metal skin.
ENGINE	Fiat A74RC38 840 h.p. 14 cylinder, double-bank, air-cooled, radial.
AIRSCREW	Fiat-Hamilton C. S. 3-bladed.
ARMAMENT	2 x 12.7 mm. forward fuselage, firing through airscrew disc.
ARMOR	2 x 7.7 mm. in wings.
PERFORMANCE	Pilot's seat armored, thickness 10 mm.
	Normal flying weight 5,200 lb. Maximum speed 290 m.p.h. at 14,500 ft. Cruising speed 250 m.p.h. at 14,500 ft. Service ceiling 32,000 ft. Range 260 miles. Endurance 1.05 hours. Fuel tankage 57 gallons. Range with overload fuel 420 miles at economical cruising speed of 150 m.p.h.



Official Photograph, U. S. Army Air Corps
Fiat's 250-MPH. G50 Fighter
Single Seater Is Fitted With 840-HP. Engine

Hot Senders . . . Sweet Swingers

45-Piece Air Force Band Bright With 'Name' Talent

MASTERS of the trombone, clarinet, French horn and sax, "hot senders" and "sweet swingers" alike, are leaving the ballroom and night club for the duration, and marching off to join the Army Air Forces.

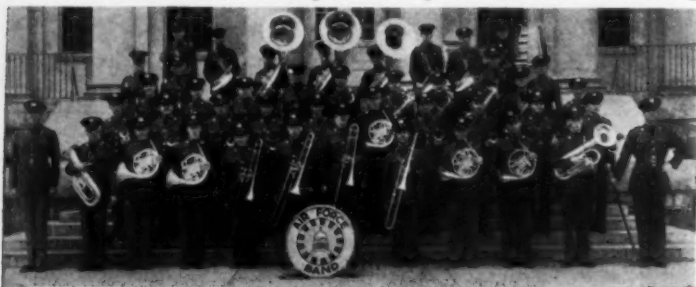
Seventy-eight Air Forces band units have already been formed and their ranks are bright with talent from America's orchestral world. However, the No. 1 band on the Air Force hit parade is the Air Force Band at Bolling Field, Washington, D. C.

Largest of the Army Air Forces band units, and directly representing the Commanding General, this organization began its official military life on Sept. 24, 1941, under Lt. Col. L. P. Holcomb, Air Corps,

charge. Holcomb himself has been known in his off-duty hours to sit in with his band and "send" with a saxophone.

One very reserved Air Forces officer loosened up to comment enthusiastically on the band's recent performance at Washington's National Airport during the Army Day observances held there: "When the band played a jitterbug number and that 'hot-lipped' trumpet player 'took off' on the second chorus, everybody present started doing a modified Jersey Bounce."

Members of the band must undergo the basic training of the soldier and, when assigned to band duty, continue training in other phases of military life. Musicians at Bolling



AAF's No. 1 Band at Bolling Field
They Play Both Martial Music and Swing

Commanding Officer of the Air Base Group at Bolling Field.

By November, the band consisted of only four men, led by Warrant Officer Alf Heiberg. Now it has 45 pieces, soon to be increased to 48.

Among its members may be found former representatives of such orchestras as Dick Stabile, Tony Pastor, Leighton Bailey, Bunny Berigan, Claude Thornhill, and Jimmy Dorsey. Three former band instructors are also in the group.

Band members, when not training, rehearsing, marching with troops, or giving concerts under the tireless eye of Col. Heiberg, proclaim themselves "the best band in the Army or anywhere else" and try to devise ways to prove it. This opinion is held with no less conviction by the Air Forces officers in

Field, most of whom hold non-commissioned officer grades, have their own barracks and a rehearsal room wherein they work daily.

Every morning the enlisted men comprising work details at Bolling Field are marched in formation from their barracks to hangars and other points. These details are escorted by the band, whose music lends snap and rhythm to an otherwise routine drill, making it, in the opinion of officers, a valuable supplement to the general training program.

The Air Forces Band also regularly gives concerts for the men of Bolling Field when weather permits, gives many public concerts, appears frequently on radio shows broadcast from Washington, and participates in general Army celebrations.



'Best Band in the Army or Anywhere Else'
They Can Also Handle a Gun

U. S. Army Air Forces Forms Flying Safety Organization

INCREASED emphasis on safety in the U. S. Army Air Forces is seen in the formation of the Flying Safety Organization, a newly formed branch of the Inspection Division, as announced by the War Dept.

Newly appointed director of the Flying Safety Organization, Lt. Col. Samuel R. Harris, whose staff will study the manifold problems of safeguarding inexperienced personnel, has designated five men to take part in this program who have been associated with the safety bureau of the CAB.

These men who have had broad experience in accident investigation and prevention are: James N. Peyton, Atlanta, Ga.; William A. Butters, Oak Park, Ill.; Ervin N. Townsend, Wayne, Mich.; Warren A. Carey, Los Angeles; and Earl R. Mitchel, Santa Monica, Cal.

"While the U. S. military aircraft accident rate is 68% lower than it was 10 years ago and 10% less than the 10-year average, constant improvement of safety measures is regarded as vital to the war effort," Army officials observed.

The Flying Safety Organization, an outgrowth of a former branch of the Inspection Division, will be under the Director of Technical Services of the Army Air Forces. Its function will be to supervise inspection and investigation of conditions, practices, and facilities which

may affect flying safety and rescue, and to study aircraft accidents and the system of reporting thereon.

Col. Harris, describing the projected activities of his staff, emphasized the psychological aspects of accident prevention.

"Human failure is the basic problem," he declared, "since less than 14% of current flying accidents are caused by mechanical difficulties. Research shows that a predominant number of accidents are due to inexperience of younger pilots. An experienced flyer rarely is involved in an accident, for men with long records in the air know the importance of taking precautions to avoid conditions and circumstances likely to result in accidents."

Expansion of the Army Air Forces, with its consequent influx of newly trained personnel and the use of high performance equipment, makes urgent the need for substituting rigid regulations and flying practices for experience.

To facilitate this policy, special research and contact work will be undertaken at once by a field staff. Regular Army and Reserve Officers with a background of accident prevention will be assigned to investigate past and future aircraft mishaps at all fields, correct dangerous or lax practices, and promote among pilots, students, and instructors alike the general idea of safety.

Army Studies Plans for Mechanic Training by CAA; Navy Lacks Interest

WHILE THE Army Air Forces is studying two alternative plans for the training of aviation mechanics by the Civil Aeronautics Administration, the Navy Bureau of Aeronautics has not yet shown interest in a similar program, according to testimony given recently by Charles I. Stanton, acting administrator of civil aeronautics, before a Senate commerce subcommittee.

One of the plans being considered by the Army provides for training by the CAA of 31,000 mechanics and specialists, "such as propeller specialists, ignition specialists, and hydraulic system specialists, in addition to the regular aircraft and engine mechanics," Stanton said.

Under the other plan the CAA would train 20,000 airplane and engine mechanics without the additional groups of specialists.

Stanton told the Senate subcommittee on civil aeronautics that the CAA favors passage of the Randolph Bill (H.R. 5695) in order to gain permission to train mechanics or aircraft technicians, in addition to civilian pilots, as requested last February by the Secretary of War.

Stanton described the present mechanic training problem as the "most seriously threatening bottleneck" in the U. S. military air effort.

"The great aircraft program which we are engaged upon in connection

with the war," he said, "requires an immensely greater number of pilots and mechanics than any nation ever expected to have to train as quickly as we must train them at the present time. The aircraft construction program and the pilot training program we believe are very much closer to schedule than the mechanic training program. That is the most threatening bottleneck we have in connection with our air effort."

To assure the U. S. armed forces of an adequate supply of mechanics to maintain their warplanes in fighting shape, Stanton urged "that it is a highly important thing to utilize all the mechanic training facilities that are available in this country. We have certain mechanic training facilities available in connection with our pilot training that can be used without interfering with or competing with any other mechanic training program."

Questioned by Sen. Harold Burton of Ohio as to whether the Navy has expressed interest in mechanic training by the CAA, Stanton replied, "Not specifically," adding that "various Naval officers have generally indicated that they thought more mechanic training should be undertaken, but we have no specific request from the (Navy) Department or the Bureau of Aeronautics."

End of Rehearsal...

While the Axis rehearsed in China and Europe for this war, America's aircraft industry rehearsed too... expanded... and completed United States approved warplane orders for Britain and others in the front line of our defense.

In a dead serious dress rehearsal for today, we designed greater, tough-muscled warplanes, and geared for greater mass production. That's why American planes are this war's

hard-boiled babies. That's why we are building more of them today, and will build yet more tomorrow. That's why air mastery inevitably will be with the United Nations.

For this mastery, Lockheed... first American mass producer for the Royal Air Force... builds P-38 "Lightning" interceptor pursuits and Hudson reconnaissance bombers. Lockheed Aircraft Corporation, Burbank, California

LOOK TO *Lockheed* FOR LEADERSHIP



CAA Provides Flight Training for 210 High School Boys in Test Program

Applications Now Being Received In 21 Localities

INIITIATION by the Civil Aeronautics Administration of an experimental program to provide flight training for 210 high school boys enrolled in 21 high schools scattered throughout the U. S. has been approved by Charles I. Stanton, Acting Administrator.

Schools where the ground training will be given have been selected and contacts have been established with qualified flight contractors, CAA announced. In order that nothing will delay prompt commencement of the training when the "go-ahead" signal is received by the regional CAA supervisors, applications from students in the high schools chosen for the experiment are now being accepted.

The experimental program will be given at the following locations: Columbus, Ga.; Idaho Falls, Ida.; Danville, Ill.; Anderson, Ind.; Battle Creek, Mich.; Mexico, Mo.; Roswell and Santa Fe, N. M.; Jamestown, N. Y.; Duncan, Okla.; Baker, Ore.; York, Pa.; Watertown, S. D.; Danville, Va.; Ensley High School, Birmingham, Ala.; Modoc Adult High School, Alturas, Cal.; East High School, Waterloo, Ia.; Flathead County High School, Kalispell, Mont.; Pershing County High School, Lovelock, Nev.; Bos Elder High School, Brigham City, Utah, and St. John's Military Academy, Delafield, Wis.

Lower Minimum Age

To open the courses to boys of high school age, the minimum age requirement for CAA training has been dropped to 17, CAA explained. The applicant must be a male citizen of the U. S. and must be regularly enrolled in high school. He must be able to pass the physical requirements set up for participants in regular CAA courses.

If he is 18 or over, an integral part of his enrollment will be his enlistment in the reserve of the armed air forces. If he is not yet 18, he must sign a pledge in affidavit form to the effect that upon attaining his 18th birthday he will apply for enlistment in the reserve, regardless of whether he is still receiving CAA training or has completed it.

If the applicant is under 21, parental consent must be obtained for either immediate enlistment or pledge of future enlistment.

In the past, facilities of the CAA pilot training program have been directed toward boys of college age, with 90% of the 70,000 pilots produced by CAA since 1939 having received their training through the colleges and universities participating in the CAA program, the announcement said.

The remaining 10% were trainees 18 to 26 years of age who won their

flight training scholarships in competitive non-college ground school courses.

Netherlands Soldiers Get Air Training Here

SEVERAL hundred Netherlands soldiers have arrived at Jackson, Miss., from Australia to undergo aviation training in accordance with an agreement recently negotiated between the U. S. and the Netherlands government, which provides for the use of an Army air base as a flying training center.

While British, Canadian, Chinese, and Latin American groups have been undergoing aviation training in this country for some time, receiving the same training as American aviation cadets under American instructors and using American-owned equipment, the Netherlands' program differs in that the Dutch will furnish their own flying instructors in order to interfere as little as possible with the U. S. Air Forces training schedule. Some American planes also have been purchased by the Netherlands government for use in flying instruction.

The technical training will for the most part be under American instructors using U. S. Army Air Forces equipment, and practically all maintenance will be handled by Army Air Forces personnel. While Netherlands officers will be in complete charge of their students, all American troops stationed at the air base in connection with the program will be under command of American officers.

The agreement provides for the use of an air base by the Dutch as a training center for approximately a year and a half.

Maj. Gen. L. H. van Oyen of the Royal Netherlands Indies Air Force, who recently arrived from Australia after the fall of Java, is the official representative of the Dutch in charge of the training program.

Air Medal Announced

The striking of a new Air Medal to be awarded members of the Army, Navy, Marine Corps, and Coast Guard for "meritorious achievement while participating in an aerial flight" has been ordered by President Roosevelt.

With the exception of the Distinguished Flying Cross, this will be the only specific decoration for feats of heroism and meritorious service in the air.

Under the President's order, not more than one Air Medal shall be awarded to any one person, but for succeeding meritorious achievement justifying additional award a suitable bar will be given to be worn with the medal.

The new decoration may be awarded by the Secretaries of War, Navy, or the Treasury, or commanding officers of the armed services.

Bomber Fleet Grows Despite Raid Losses

EVEN IF the heaviest losses suffered so far in mass raids on Germany were incurred over a sustained period, Britain's bombing fleet would continue to grow, Geoffrey Parsons, Jr. reports from London to the New York Herald Tribune.

Having inspected some of Britain's heavy bomber plants, Parsons states that four-engine Halifaxes and Stirlings are being turned out at "a surprising and gratifying rate."



NACA Test Cell: Research activities were started on May 8 in the first of six major units of the NACA's \$18,000,000 Cleveland laboratory. First operations were in the engine-propelled research cell with its two torque stands capable of testing engines up to 4,000 hp. Originally planned for completion over a period of two and one-half years, the lab is being rushed to completion at least one year ahead of schedule.

Army Air Forces Mechanics Take Factory Course

POST graduate training will be given to several thousand Army Air Forces mechanics each month in the principal factories of the aircraft industry producing combat planes and engines for the Army Air Forces under a new nation-wide factory training program for enlisted men.

This program, already in operation in the plants of more than 20 of the leading aircraft manufacturers, was ordered by Lt. Gen. Henry H. Arnold, to insure a continuous source of experts in the maintenance and repair of the Air Forces' fighters and bombers.

The mechanics selected for this specialized training will be brought into actual contact along the production and assembly lines with the airplanes and flying equipment that will be their responsibility under combat conditions. They will have an opportunity to study the latest technical developments under the guidance of the aviation industry's engineers. Upon graduation they will serve as key men on the Army Air Forces' enlisted flight and maintenance crews.

Only men already trained in aviation mechanics will be sent to schools in the factories producing combat airplanes, engines, propellers, gun turrets, and other units. The first groups are being chosen from the advanced classes of Air Force Technical Training Schools.

As the program progresses, however, factory "post graduate" instruction will be made available to Air Force mechanics with both tactical and depot units, upon recommendation of commanding officers. The courses are from two to four week's duration, depending on the type of training, with classes varying in size from 10 to 600.

In order that this program will not add to the burden of already over-crowded industrial communities, the classes will be limited in size to the facilities of the factories to feed and shelter the additional Air Force personnel involved.

It is expected that this training program will eventually make it possible for enlisted members of flight crews and certain key members of ground maintenance crews (flight engineers, crew chiefs, radio operators, radio mechanics, etc.) to meet their airplanes at some proper stage in the production line. They will then follow through the final stages of production, be graduated from the factory school as their machines roll off the line, and fly away with their airplanes.

Exam Rules Relaxed

Civil Aeronautics Board has amended the Civil Air Regulations to permit applicants for pilot certificates, lighter-than-air pilot certificates, and instructor ratings to retake examinations previously failed after five hours of additional instruction on each subject from a properly rated ground instructor.

Designed and being used for WAR

STREAMLINED with a 16% saving in weight—SIMPLIFIED by the elimination of 7 parts and designed so that it can be completely disassembled and serviced with only a screw driver and pliers—INCREASED IN PERFORMANCE, through more extensive use of Bendix Plastic elements and resulting in 19% lower handle loads...this is the outstanding story of the new war-standardized Bendix Hydraulic Hand Pump.

The extreme simplicity of the new design makes this pump a fast production item. It has been designed to meet the new AN Standard, and has demonstrated its unparalleled efficiency in a life test of 110,000 cycles. In addition to Plastic poppet valves, the new pump incorporates a Plastic piston head and main bearing—further increasing the remarkable service life of this equipment as well as releasing additional vital metal for other uses.













The new Bendix Hand Pump—Model 2232-B25—is now specified for use on U. S. Army airplanes.

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SEQUENCE VALVES  HYDRAULIC SELECTOR VALVES  TUBE CLAMPS  CUSTOM BUILT RADIO 

Plane Production Still Held Down by Material Shortage, Martin States

GLENN L. MARTIN Co. could turn out bombers for U. S. and British forces at a rate five times that of a year ago, except for a shortage of vital materials, Glenn L. Martin, president, told correspondents on a recent "production for victory" tour of war industries.

"Our production is nearly four times what it was a year ago," Martin said. "We have enough plant tools scheduled to deliver more than five times last year's volume this year, but apparently it will be about four times last year's production—not five—because we can't get materials soon enough in the quantities we need."

"We were given a priority rating of A-1-d when battleships, trucks, tanks and guns got an A-1-a rating. Later we discovered that we were in the A-1-a group, with battleships, tanks, guns, and even four-motored planes still grouped ahead of us."

"We need metal, we need instruments, we need steel alloys and other essential parts to turn out bombers, but in spite of these deficiencies we have upped our production four times within a year and are on the way to peak production in August."

Army Air-Ground Operations Face Summer Trials

ARMY FIELD maneuvers, which will stress air-ground operations, this summer will provide the most thorough training ever developed for American troops, War Dept. officials forecast.

Beginning late last month and extending through the first week in November, the general training plan will be arranged so that maneuver periods requiring the cooperation of the Army Air Forces and the Armored Force will not conflict.

Instead of the large maneuvers of last year in which hundreds of thousands of troops in two field armies, comprising two or more



Air-Ground Cooperation

Observer, Pilot Plan Mission

Army Corps each, struggled to mimic warfare over extensive battlefields, this year's exercises will be limited to troops within Army Corps.

Four maneuver areas will be used; the Desert Training Center, in the Southwest; the Louisiana Maneuver Area; the Carolina Area, including parts of both North and South Carolina; and the Camp Forrest Area in Tennessee.

This training will be given every semblance of reality. Some of it, at least one-third, will be at night. Smoke screens, aircraft of all types—including parachute troop carriers and transport planes—armored forces, and all other weapons of modern warfare will be utilized in the maneuvers.

The Army 'A'

The Army shortly will begin awarding "A" flags to plants for outstanding performance in production, and special lapel buttons for their employees, similar to the Navy "E" awards.

The Army "A" flag to be awarded is of burgee design, and is similar in size and shape to the Navy "E" flag. White stars will represent additional awards.

What Others Say

NEW YORK DAILY NEWS—"All in all, it is the airplane which has delivered the most dramatic results in this war to date, and the most effective, among all the weapons used in present-day warfare."

AIR MARSHAL A. T. HARRIS, commander in chief of the British Bomber Command—"If I could send 20,000 bombers to Germany tonight Germany would not be in the war tomorrow. If I could send 1,000 bombers to Germany every night we could end the war by autumn."

SEN. SHERIDAN DOWNEY (D., Cal.)—"The day is not too distant when heavy bombers will be capable of cruising 6,000 miles carrying 50 tons of explosives. Those ships can best be built in America."

SEN. EDWIN C. JOHNSON (D., Colo.)—"Battleships can still be effective in bombarding coastal cities that are not protected by aircraft. Furthermore, they can do tremendous damage to convoys in the Atlantic that are not protected by heavy naval units."

READER'S DIGEST—"As a playful precaution against bombing, an Ohio suburbanite painted this sign on his roof: Any Resemblance Between This Roof and That of the Wright Aeronautical Plant Is Purely Coincidental."

MARION M. NEWELL, retiring president, Women's National Aeronautical Association—"Our membership . . . has been able to mold the thinking of business women, busy matrons, and young careerists into the channels of air mindedness. We have made members of women who had previously given little thought to aviation—women who had formerly held their husbands back because of a fear of flying—women who had mistakenly clutched their young sons to selfish hearts in the thought of keeping them from pilots' careers."

AERONAUTICS (British)—"The other day a pilot force-landed at a satellite aerodrome, and waited 40 minutes in solitude before an airman arrived on the scene, very out of breath. 'Very sorry, sir,' he said, 'but we was all attending a lecture on aerodrome defence.'"

EUGENE E. WILSON, president, United Aircraft Corp.—"The aircraft industry is going great guns, running well ahead of so-called impossible schedules."

LT. GEN. BREHON B. SOMERVILLE—"We must convince ourselves that this job of turning out the arms and ammunition for our fighting forces is not just another job. Unless we do it supremely well there aren't going to be any jobs at all, as we know jobs, there aren't going to be any closed shops and there aren't going to be any open shops. Hitler and the Japs aren't in the least interested in the 40-hour week—or the 50-hour week or the 60-hour week. They're not interested in little business or big business."

C. G. GREY, in *The Aeroplane* (British)—"After the last war everybody used to say that the war had pushed forward the development of aviation by 20 years. As a matter of fact the last war held back the development of aviation to such an extent that we are, if anything, a little more backward now than we were in 1914. At any rate in 1914 and 1918 we had airplanes in which any moderately good pilot could make a forced landing without killing himself. And I should like to know what percentage of pilots in any of the belligerent air forces today could make a forced landing in bad country without crashing his machine."

Canada's Air Arm Over 115,000

MORE THAN 115,000 men are in the Canadian air forces, exclusive of 3,000 women, Australian, New Zealand, and United Kingdom units and civilians, Air Minister C. G. Power, reported recently to the House of Commons.

He said that 10 different types of airmen are being turned out at Commonwealth air training schools, which have sufficient ground crews and mechanics for all present needs and could be easily expanded to take on additional responsibilities.

This was interpreted by American officials to forecast the training of American pilots and ground crews in Canada.

Referring to the "officer vs. noncommissioned officer" situation, Power declared that every member of an air crew should be an officer, and that he intended to see that the difference between a "gentleman" and a "player" is abolished.



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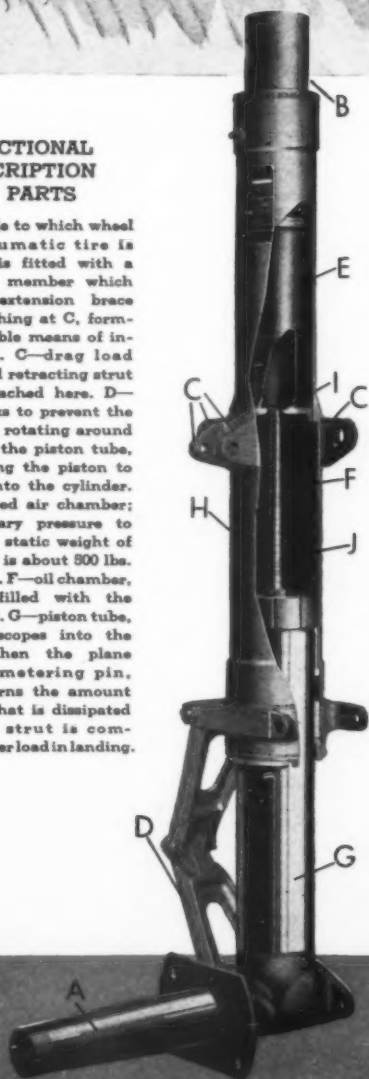
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How AEROL STRUTS KEEP 'EM LANDING *safely and smoothly*

FUNCTIONAL DESCRIPTION OF PARTS

A—stub axle to which wheel with pneumatic tire is fitted. B—is fitted with a supporting member which also has extension brace arms attaching at C, forming a suitable means of installation. C—drag load bracing and retracting strut can be attached here. D—torsion links to prevent the wheel from rotating around the axis of the piston tube, also allowing the piston to telescope into the cylinder. E—compressed air chamber; the necessary pressure to sustain the static weight of an airplane is about 500 lbs. to the sq. in. F—oil chamber, which is filled with the proper fluid. G—piston tube, which telescopes into the cylinder when the plane lands. J—metering pin, which governs the amount of energy that is dissipated when the strut is compressed under load in landing.



From the modest-sized trainer to the mightiest bomber, on every terrain and in every climate, Aerol Struts are serving America's air force, providing complete safety to plane and crew when landing.

Intensive research, skilled engineering and precision craftsmanship explain why Aerol Struts have overwhelming preference throughout all branches of American aviation. For it is a big job to bring a 30-ton bomber to a smooth, effortless landing, but Aerol Struts are designed and built to do the trick. They are of the oleo-pneumatic type—oil dissipates the terrific energy created when landing, compressed air carries the static weight of the plane and cushions the more moderate shocks of taxiing and take-offs.

Here's how it is done: When the wheel, mounted on axle A, makes contact with the ground, the upward thrust telescopes the piston G into cylinder H. This causes the oil in chamber F to be forced through the orifice I, around the metering pin J, thereby creating a hydraulic resistance in chamber F. This resistance, controlled by the shape of metering pin J, dissipates the energy. The flow of the fluid through the orifice into chamber E compresses the air from its nominal value, creating further resistance to the telescoping motion. The piston is returned to the extended position by expansion of compressed air which is controlled by a return valve, eliminating excessive recoil to the piston.

Perhaps, in cold print, this seems like prosaic engineering—but thousands of gallant pilots confidently rely on the unsurpassed efficiency of Aerol Struts.

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Senate Group Votes \$199,740,000 For Airports

Increases CAA Funds \$203,934,600 Over House Bill

FURTHER tremendous development of U. S. airports was seen last fortnight when the Senate Appropriations Committee added \$199,740,000 to the 1943 Commerce Dept. appropriations bill for construction by the CAA for 164 new fields and for improvements and enlargements at 266 existing fields.

In all, the Senate committee added \$203,934,600 to the House-approved bill for the CAA. In addition to the \$199,740,000 for airports, the increase provides \$3,675,000 for establishment of air navigation facilities and \$519,600 for technical development.

To the 1943 Agriculture Dept. appropriation measure, the Senate group added \$50,000 for development of turf grass to alleviate the dust nuisance at airplane landing areas, approved \$1,000,000 for the Forest Products Service for development of wood products for aircraft, and provided \$202,629 for forest surveys.

The committee recommended a decrease of \$9,600 in the \$1,249,500 approved by the House as a 1943 Civil Aeronautics Board allocation. The cut is in the printing and binding expenses of the Board. The House allocation for CAB represented an increase of \$70,000 over 1942 and a reduction of \$31,237 under Budget Bureau estimates.

All Senate-approved items must be agreed to in conference with the House before becoming final.

Alaskan Improvements

Of the \$3,675,000 added by the Senate committee for air navigation facilities, \$2,875,000 is to cover construction of radiosonde and weather observation stations and for the extension and improvement of intermediate landing fields in Alaska, all of which is specifically requested by the Secretary of War.

The \$519,600 for technical development is said to be necessary for certain airport development projects, also in compliance with a special request of the Secretary of War.

In addition to developing 164 new airports and improving 266 existing ones, the \$199,740,000 increase will provide additional landing facilities in the U. S. for use of the Army Ferrying Command and will enable completion of certain airports in Alaska.

Last year \$159,600,000 was provided for development of landing areas for national defense under the CAA. The \$199,740,000 for 1943 was added by the Senate because at the time the bill went through the House, CAA had not prepared its estimates.

The \$65,098,000 CAA appropriation passed by the House—raised to a total of \$269,032,600 by the \$203,-

934,600 Senate increase—was allocated as follows:
General Administration \$1,635,000
Maintenance and Operation of Air-Navigation Facilities ... 18,388,000
Establishment of Air-Navigation Facilities 5,640,000
Technical Development 380,000
Enforcement of Safety Regulations 2,590,000
Civilian Pilot Training 36,000,000
Washington National Airport 465,900

Total \$65,098,000
Last year Congress made \$25,000,000 available for CPT. Of the \$36,000,000 allocated by the present appropriation bill \$8,000,000 is recommended to be made available immediately "in order to get the accelerated program in prompt operation." Amendment to the Commerce Dept. bill—requested by the President and offered by Sen. Mc-

Carran (D., Nev.)—would reimburse the President's emergency fund by \$2,000,000 from the 1943 CAA appropriation, a sum taken for the training of some 2,000 instructors and special-service pilots.

Dept. of Agriculture

The forest products program of the Dept. of Agriculture is being carried out in close collaboration with the Army, Navy, CAA, NACA, and WPB.

Investigations in timber mechanics and engineering include various studies of plywood in relation to aircraft design, particularly the plywood buckling and strength problems; the evaluation of pregrenated wood as an aircraft material; the development of laminated con-

struction for airplanes; and the preparation of specifications for aircraft woods.

Investigations in seasoning and physical properties include studies on the chemical seasoning and accelerated drying of lumber and timbers; of gluing with high-frequency electrostatic machines and the further development of plastic wood and its possible substitution for critical metals such as steel, copper, aluminum, and other scarce metals.

Wood preservation investigations include studies of the effect of drying temperature on the strength of veneer; improvement in the manufacture of flat and molded plywood and the suitability of new synthetic resin glues in the assembly of airplane parts; improvement of finishes and moisture repellents for airplanes and fire-retardant treatments for structures of various kinds and the determination of the effectiveness of preservatives that may be substituted for those that are scarce or may become so.

The House cut by \$47,371 the Budget estimate of \$250,000 for forest survey activities by the Dept. of Agriculture and the Senate Appropriations Committee did not raise the figure despite a convincing statement by Rep. Jennings Randolph (D., W. Va.) at hearings.

"That survey certainly is contributing to war needs and the effort to prosecute a successful conflict," Randolph stated. "The WPB has constantly been in touch with forest survey officials to find facts and figures and to use special studies which have been made regarding the figures and to use special studies which have been made regarding the forest resources, the extent and location of the critical species, including the Sitka spruce, ash, oak, walnut, and chestnut. That survey has also included the location, the capacity, and the production of our forestry plants."

More and More Wood

He continued: "I especially desire to say that my interest in the field of aviation has caused me to realize that increasingly we are going to use wood in the production of fighting planes. Already we are having planes produced in experimental stages of 90% wood and only 10% steel or other metals."

After testimony by Randolph, Sen. Nye (R., N. D.), and Agriculture Dept. officials, the Senate Committee included a \$50,000 allocation in the 1943 Agriculture Appropriation bill for developing a turf grass that will withstand the wash of airplane propellers.

"A recent case of damage to airplane motors from preventable dust reduced the motors' efficiency by 90%," Nye reported, "required overhauls costing \$320,000, and will be repeated again and again on the nation's dirt-surfaced flying fields for want of intelligent and relatively inexpensive remedial steps."

P. V. Cardon, assistant agricultural research administrator, said the department would require six

(Turn to page 21)

Airpower Appropriations Since Pearl Harbor

SINCE THE FIRST wartime appropriation of Dec. 17, Congress has boosted:

- 1. Army Air Corps appropriations (1942 supplements) to a total of \$18,000,000,000.
- 2. Navy Bureau of Aeronautics funds (1943 and 1942 supplements) to \$7,000,000,000.
- 3. CAA appropriations—pending Senate approval of the 1943 Commerce Dept. Appropriation Bill—to \$338,999,012.

Within 10 days after Pearl Harbor, Congress had approved the Third Supplemental Act (1942)—the first wartime appropriation—carrying \$779,000,000 for the Army Air Corps, \$18,750,000 for Navy acquisition of Floyd Bennett Field, \$309,720,000 cash and \$640,000,000 contract authorization for the Navy Bureau of Aeronautics, and \$67,139,629 for the CAA.

The CAA total is divided as follows: \$59,115,300 for development of landing areas, \$84,000 for Washington National Airport, \$7,792,290 for the establishment of air-navigation facilities, and \$223,702 for technical developments.

A month after the Third Supplemental (Dec. 17) came the \$12,500,000,000 Fourth Supplemental (Jan. 30), entirely for the nation's air arm—\$9,000,000,000 went to the Air Corps for procurement of 33,000 additional planes, the remainder was for ammunition and equipment for those planes.

A week later the Senate tacked on a \$4,500,000,000 additional 1942 supplement to the \$1,500,000,000 appropriation for the Navy Bureau of Aeronautics approved by the House. Pearl Harbor and incidents subsequent, Rear Adm. J. H. Towers, chief of the Bureau, said at Senate Appropriations Committee hearings, necessitated the supplemental request. The Bureau's request was carried in the 1943 Navy Appropriation Act, approved Feb. 7.

By Mar. 5, Congress had approved the Fifth Supplemental—mainly to provide for the Army's expanded man power—carrying a \$167,440,000 supplemental appropriation for the Air Corps.

The Sixth Supplemental approved Apr. 28 allocated \$8,515,861,251 to the Army Air Corps; \$464,827,500 to the Navy Bureau of Aeronautics; \$3,500,000 to the National Advisory Committee on Aeronautics; \$2,926,720 to the CAA. Also included in the Sixth Supplemental is an allocation of \$800,000,000 for Naval shore establishments, including \$168,780,000 for aviation facilities and \$25,000,000 for the lighter-than-air program.

Last week Congress completed action on the Independent Offices Appropriation bill, carrying an NACA allocation for 1943 of \$19,000,000—\$3,000,000 more than was carried in the 1942 bill.

The 1943 War Dept. bill is yet to come.

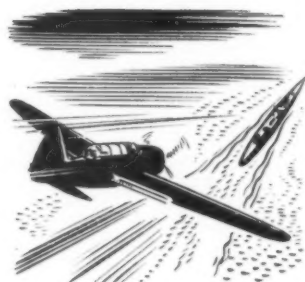
At the beginning of the year, the President set the aircraft production goal at 60,000 planes for 1942 and 125,000 planes for 1943.

The Army is charged with procuring 148,000 planes under the President's two-year program. As a first step to meet the President's goal, the Fourth Supplemental provided for procurement of 33,000 aircraft; as a second step, the Sixth Supplemental provides for procurement of 31,070 aircraft. Except for 23,550 planes which will be provided for in the 1943 War Dept. Appropriation, the Army Air Corps' objectives under the President's program have been taken care of.

The Navy's aircraft procurement goal, according to Adm. Towers, is 18,000 planes for 1942 and 21,000 for 1943. The 1942 supplement contained in the 1943 Navy Appropriation Act will accomplish the 18,000 goal for planes this year, Adm. Towers says.



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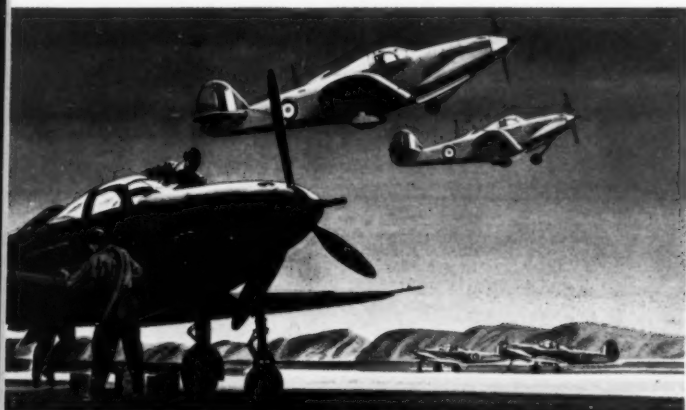
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CONSOLIDATED PB2Y-2 CORONADO



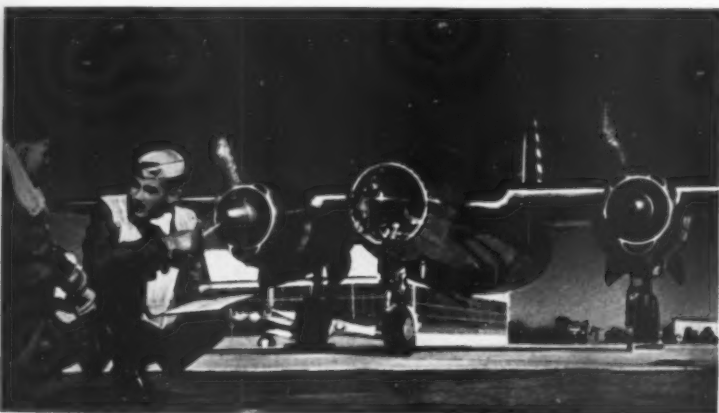
BREWSTER SB2A-1 BUCCANEERS



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Agriculture

(Continued from page 16)

or seven field areas to develop turf grasses suited to the climatic and soil conditions of various air field areas. Department officials were optimistic that a suitable turf grass could be developed for landing areas for light aircraft, and predicted that tests would give results that would be definitely worthwhile in three or four months. According to testimony, the experimentation on turf grass has been requested by the War and Navy Depts. and the CAA. One Dept. of Agriculture official reported:

"At one Army basic flying school it was found that the dust had decreased the efficiency of airplane motors 90% due to dust wear on the cylinders. The cost of overhauling and reconditioning each motor was in excess of \$1,600. With 200 planes on this field the cost of one overhauling represented a total in excess of \$320,000.

"This field is in an area where grass normally grows well. The complete grassing of this field of 800 acres should not have cost more than \$100 an acre, or a total of \$80,000, being 25% of the cost of one overhauling of the motors."

Aero Books in Spanish

The Division of Aeronautics, Library of Congress, Washington, D. C., has issued a bibliography of 57 aeronautical books in Spanish. The bibliography is for free distribution on request.

Senate Approves \$19,082,736 for NACA

THE SENATE has approved and referred to joint conference the 1943 Independent Offices Bill, carrying an NACA allocation of \$19,082,736.

The Senate's figure represents an increase of \$4,071,000 for the NACA aircraft engine research laboratory at Cleveland and a decrease of \$6,592 for travel expenses over the House-approved allocation of \$15,018,328.

On Mar. 23, the President requested of the Senate an additional \$7,571,000 for the NACA Cleveland Laboratory—\$3,500,000 as a 1942 supplement and \$4,071,000 for the 1943 fiscal year. The Senate included \$3,500,000 in the recently approved Sixth Supplemental Act.

The original estimate for the Cleveland laboratory was \$10,068,000, subsequently increased to \$13,971,000, and now up to \$18,171,000. The project is expected to be complete within a year.

Committee Reports Small Business Bill

THE MURRAY-Patman bill authorizing the establishment of a Smaller War Plants Corp. in the WPB to utilize small business in the defense program, has been reported out favorably by the House Committee on Banking and Currency.

A House Committee amendment to the bill as passed by the Senate increases from \$100,000,000 to \$200,000,000 the revolving fund to be provided for the corporation.

Blimp Bills Pending

Both House and Senate Naval Affairs committees have favorably reported out bills authorizing construction of 24 addition non-rigid lighter-than-air craft.

The House bill contains a flexible clause giving the Secretary of Navy power to raise the maximum number of lighter-than-air craft (set by the bills at 72; at present set at 48) without Congressional action.

The increased number of blimps will be used by the Navy in an anti-submarine campaign.

House Committee Studies Production

MEMBERS of the Navy sub-committee of the House Appropriations Committee left Washington on May 15 on an investigative tour to determine the progress of Naval defense projects and scrutinize bottlenecks causing production slow-downs.

The Committee, headed by Rep. Sheppard (D., Cal.), includes: Rep. Scrugham (D., Nev.); Rep. Casey (D., Mass.); Rep. Beam (D., Ill.); Rep. Johnson (R., Ind.); and Rep. Ditter (R., Pa.).

Chairman Sheppard said the itinerary will include "aircraft producing elements."

The committee is traveling by train, making its first stop at Reno, then proceeding to San Francisco, Los Angeles, San Diego, Houston, Corpus Christi, New Orleans, Jacksonville, and Wilmington, N. C. Members expect to return to Washington about June 5.

House Ups RFC Limit 5 Billions

THE HOUSE has approved legislation increasing the allowable indebtedness of the RFC by \$5,000,000,000. The House bill will be substituted for the companion Senate bill which has already been favorably considered by the Senate Banking and Currency Committee.

Testimony by RFC Administrator Jones quoted on the floor of the House reveals:

"We have authorized expenditures in connection with the war program of something like \$13,000,000,000 . . . There are approximately \$2,000,000,000 for construction of plants for manufacture of aircraft, \$360,000,000 for manufacture of magnesium, \$700,000,000 for synthetic rubber, \$734,000,000 for steel, \$468,000,000 for ordnance, and \$182,000,000 for building shipyards. Expenditure for production of aluminum with which to make airplanes will increase capacity of this country of aluminum to 2,100,000,000 lbs. a year. Two years ago it was 300,000,000. One year ago it was 540,000,000."

"The plants manufacturing planes next year will be double what they are this year. But we expect to have the aluminum. Those plants will all be completed—there are several more coming in the next two or three months—they should all be finished in the very early part of next year."

Jones said RFC had purchased "practically all" of the transport planes which were privately owned.

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30 ROCKEFELLER PLAZA, NEW YORK

U. S. Railroads Seek Transportation Monopoly, Dept. of Justice Charges

Anti-Trust Unit Asks Intervention In REA Inquiry

ASSERTING that it has been "advised" that the railroads are seeking to gain a monopoly of all transportation, the Antitrust Division of the Dept. of Justice on May 15 asked permission to intervene in the investigation of the Civil Aeronautics Board into the contracts of Railway Express Agency and the airlines.

The Division bluntly warned that the railroads should not be allowed to enter the motor, water, or air carrier fields "without restriction."

This marks the first time the Dept. of Justice has sought intervention in a CAB case. The investigation into REA contracts has been pending for many months and at present hearings are indefinitely postponed.

Particular significance is attached to the requested intervention inasmuch as REA would be exempted from prosecution under the anti-trust laws if its contracts were approved under Sec. 412 of the Civil Aeronautics Act (Sec. 414 of the Act states that "any person affected by any order made under sections 408, 409 or 412 . . . shall be, and is hereby, relieved from the operations of the 'antitrust laws . . .')"

However, by entering the case now, the Anti-trust Division is not bound by that section of the Act.

The Division's petition for intervention stated:

"That the federal anti-trust laws are applicable to carriers for hire engaged in interstate or foreign commerce; that the Anti-trust Division is concerned with any agreement or arrangement between such carriers which will restrain competition and tend to establish a monopoly; that the application herein seeks approval of this commission of certain contracts between Railway Express Agency Inc. and 23 or more airline corporations, providing for the development and operation by the respective parties thereto of a nation-wide air express service, which contracts on their face involve the public issues of restraint and monopoly.

Stifle Small Carriers

"That this division is advised that railroad companies are seeking through ownership and direct operation of competing forms of transportation and through operation jointly of the Railway Express Agency to restore in the railroads a monopoly of transportation. This, it is contended, will result if railroads are permitted to enter the

motor, water, and air carrier fields without restriction, because the large resources of the railroads, including railroad stations, employees, soliciting forces and their ability to cut rates and absorb losses, would give independent competing carriers little chance to survive.

"That because of their property interests private parties to the proceedings are not primarily concerned with these substantial public issues; that the Anti-trust Division is the only governmental agency charged with the duty of investigating complaints with respect to restraints and monopolies and to present evidence thereon; and that participation by the Anti-trust Division in this proceeding is in furtherance of the anti-monopoly policy of Congress as expressed in the Interstate Commerce Act which the Commission administers and the Federal anti-trust laws which the Division must enforce."

The petition was filed by direction of Assistant Attorney General Thurman Arnold.

TCA Standardization

In line with the policy laid down by the Canadian government calling for standardization of equipment, as far as possible, Trans-Canada Air Lines has begun installation of twin-row Wasp engines in all Lockheed 14s. The change-over will "result in economies of operation along with reductions in spart parts requirements and easing the pressure on engine manufacturers," the company states.

New PAA Ad Agency

J. Walter Thompson Co. has been appointed as the general advertising agency for Pan American Airways. Samuel W. Meek, vice president of the agency, is the account executive. It is understood that future advertising will be of an institutional character and in the nature of reports on war-time operations of the company.

Extension of TCA To Ireland Urged

A CANADIAN link across the Atlantic should be established by an extension of Trans-Canada Air Lines, according to an editorial in the Ottawa Evening Citizen.

The newspaper said resumption of Pan American Airways' north Atlantic service was "welcome news," but added that the Canadian airline should also be in the picture.

"The capacity of TCA has been demonstrated in years of exemplary service across this continent," the editorial asserted. "It is the next logical step to carry on from Moncton, or wherever the ocean airway terminals may be, eastward via Newfoundland."

"On the other side, the nearest terminal airport would doubtless be somewhere in northern Ireland. Eire's neutrality would make it inadvisable to land where men on active service are liable to be interned. Eventually the air trip is likely to be made at a high altitude without stopping either at Newfoundland or Ireland."

"Much preparatory work has been done in the Department of Transport at Ottawa to plan this extension of the air mail service. Under Clarence D. Howe's direction early in the war, plans were ready . . .

"While the aircraft industry is geared entirely for war, however, it is difficult to obtain suitable machines for passenger service. The volume of air mail would probably alone be as much as the available aircraft could handle. There is little doubt that the service would pay. As soon as possible, it should come as an extension of Trans-Canada Air Lines."

MCA Awarded Mail Pay Boost

MID-CONTINENT Airlines has been granted an air mail rate of 41.83c per airplane mile, retroactive to Jan. 1, 1942. Under the new rate, MCA will receive about \$180,000 more per year in mail pay, plus \$60,000 retroactive increase.

The rate, which applies to both of the company's routes, is for months when average daily designated mileage does not exceed 6,994 miles and is for base poundage of 300 lbs. (plus .03c per airplane mile for each pound, or fraction, of excess).

For months over 6,994, the rate and adjusted base poundage will bear the same relation to 41.83c and 300 lbs. as 6,994 miles bears to the average daily designated mileage.

NWA Accident

Three Northwest Airlines' pilots were killed May 12 when one of the company's planes overshot the Miles City, Mont., airport and crashed in a ravine. Capt. E. S. Shank, First Officer Donald H. Nygren, and Capt. K. R. Martin, riding as a third member of the crew, lost their lives, but 11 passengers and Stewardess Lois Hallom escaped.



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Mr. Wayne W. Parrish,
American Aviation,
Earle Building,
Washington, D.C.,
U.S.A.



Your ref.
Your letter
to

Our ref. PU/VA.

Date Stockholm, March 30th, 1942.

In your reply please state our reference

Dear Mr. Parrish,

Since the outbreak of the war between the U.S. and Japan Sweden has not had any mail connection with your country. This letter is sent by the first new mail connection established by our company's courier flights between Stockholm and Scotland. Mail to Great Britain and the U.S. is now again officially accepted at all post offices in Sweden. We are flying this line by night at irregular dates and at the height of 6,000 - 8,000 metres. We are very happy to have this possibility to send letters to our friends in Great Britain and the U.S.

The old plans of an air line between your country and Sweden seem to me to-day to be more important than ever and I really hope that in the not too distant future such an air line could be inaugurated.

With my very best regards, I remain,

Yours sincerely,

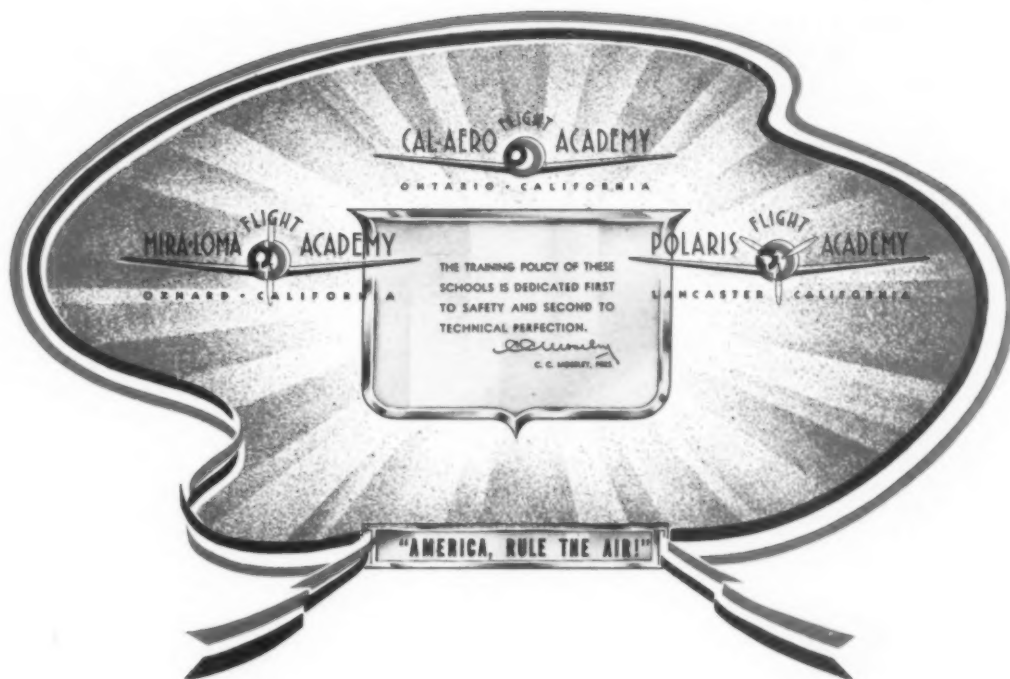
Per A. Norlin

Per A. Norlin.

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First Air Mail From Sweden

Per Norlin Sends His Regards



In order to give maximum assistance to the national defense program, and for the duration of the present emergency, Cal-Aero Flight Academy, Mira Loma Flight Academy and Polaris Flight Academy will continue to devote their entire efforts and modern airport-academy bases at Ontario, Oxnard, Lancaster and Glendale, California, exclusively to the training of Flying Cadets for U. S. Army Air Force and Royal Air Force.

Board Defends Actions in Answer To Senate Inquiry on Airline Planes

Claims War Blocked Further Growth of Fleet

By ERIC BRAMLEY

U. S. AIRLINES have had sufficient flying equipment to meet the demands "of a growing air transportation system which has been developed rapidly and been expanded in accordance with the declared policy of the Civil Aeronautics Act," the Civil Aeronautics Board has told the Senate.

This statement was made by the Board in a 30-page reply to a resolution introduced Mar. 9 by Sen. Walter F. George (D., Ga.). The resolution sought to ascertain what CAB has done and intends to do concerning the airline equipment situation, and Sen. George claimed that Congress had passed the Act "with the firm intention that the air transport industry of the U. S. be developed far beyond its present extent."

Defending itself, CAB asserted that "the supply of equipment has not been sufficient to meet those demands (of a growing air transportation system) and, at the same time, all the military transport aircraft needs of the armed forces in war time."

"Such requirements of the armed forces are, of course, far greater than the number of transport planes that would have been adequate for the operation of an air transportation system even in war time."

The Board stated further that:

● As a result of the priorities system brought on by the emergency, the airlines were able, during the entire existence of the Act, to secure planes for re-equipment and expansion only between Aug. 1938 and the end of 1940.

● The domestic and foreign airline systems have been expanded materially under the new law.

● Congress has given the Board no powers or duties with respect to the quantity of aircraft production as such.

● Congress has not given the Board the power to grant direct financial assistance in the construction or purchase of aircraft.

● The Act has not been construed as directing CAB, in considering national defense needs, to undertake the establishment of a reservoir of transport aircraft in excess of the number reasonably required for the efficient maintenance and development of the air transportation system, nor as empowering CAB in following such a course to plan the requirements for military transport aircraft.

● The Act does not justify expansion "for expansion's sake only."

● Production for war and requisitioning of airline planes for war uses present an "insurmountable obstacle" to continued normal development of the airlines.

Financially Strong

The industry has, under CAB, been in a financial position to undertake any expansion necessary and desirable, CAB asserted, adding that it will continue to maintain the carriers in such a position, through mail compensation.

"The Board feels that the air transport industry is still young, that it is at the threshold of an era of fast development," the report stated. "New technical discoveries being made are certain to clear the way to the expansion of the air transportation system to smaller communities with planes of low operating cost."

"There are many who envision air freight as a major element in the air transportation system. There are the possibilities of feeder and other special services for hundreds of small communities. When the equipment and facilities are available, the Board is prepared to foster the expansion of the air transportation system and its services into every field justifiable under the Act."

"In this development and expansion which is certain to take place, new carriers with fresh enterprise and capital will undoubtedly seek to play a prominent part. One of the mandates to the Board is to promote 'competition to the extent necessary to assure the sound development of an air transportation system.' Such of those new carriers as meet the statutory requirements of being 'fit, willing and able' and who can best serve the public need, will, by authority and encouragement of the Board, find their place in the air transportation system, if the services they seek to perform are required by the public convenience and necessity."

'Liberal Interpretation'

The Board claimed that it has placed an "extremely liberal interpretation" upon the standard of convenience and necessity in awarding routes.

"There have been instances where the Board has issued certificates for routes where the passenger loads have been extremely light," it said. "It has repeatedly authorized the issuance of certificates in circumstances where there was no indication that the average passenger load would be greater than approximately one-fifth of the passenger-carrying capacity of the plane or that the route would become independent of government support for a long time in the future."

In the matter of mail compensation the Board also claimed to have been "extremely liberal."

On Aug. 22, 1938, when the Act went into effect, there were 38,564 route-miles covering 237 cities, the report explained. On Apr. 1, 1942, this had risen to 45,985 miles and 353 cities, and in addition 67 new services had been added to 48 cities which already had air service when the Act was passed.

In the foreign field, route-miles have increased from 30,781 to 84,928.

Existing routes meet a "substantial proportion of the significant possibilities for air transportation service between points," the Board claimed. On Jan. 1, 1942, there were only 75 cities with 25,000 or more population which were more than 25 miles distant from a certificated air stop, it said.

"It might be observed incidentally that the expansion of the domestic air transportation system to embrace what would be comparatively and on the whole the smaller cities of the country would not result in the establishment of any sizeable reservoir of transport aircraft."

"Roughly speaking, an overnight expansion of 10,000 route-miles, extending air transportation to the smaller cities of the country, would probably require not more than 40 or 50 units of equipment . . . Some of the carriers who might secure the new services might very well find it possible to serve the new routes simply by an increased utilization of equipment on hand."

Increased Investment

The airlines increased their investment in real property and equipment from \$33,723,195 on July 1, 1938, to \$61,077,593 three years later, CAB said. On Aug. 31, 1938, the lines had 241 planes with 3,669 seats. "From that date to Dec. 31, 1941, they had acquired 234 additional aircraft with 4,663 available seats. During the same period, 125 aircraft with 1,628 available seats were retired. Of these, 27 . . . were given up to the U. S., the Royal Dutch Lines, and the Aircraft Exporting Corp. . . . Nearly all of the remainder were voluntarily disposed of."

"The number of aircraft on hand on Dec. 31, 1941, was 350, with 6,704 available seats. The net increase during the period was 109 aircraft, or 45.23%, and 3,035 available seats, or 82.72%."

In the foreign field, the Board explained that on Aug. 31, 1938, Pan American Airways had 85 planes with 1,507 seats. Between then and Dec. 31, 1941, the company acquired 69 more ships with 1,870 seats and retired 52 planes with 1,472 seats, leaving on hand on the latter date 102 planes with 1,905 seats. The net increase was 17 planes, or 20%, and 398 seats, or 26.41%.

While the number of domestic aircraft has increased by less than 50%, "the mileage flown annually was being nearly doubled and the

passenger traffic handled more than tripled. This growth has resulted from the intensive development of traffic on the domestic air transportation system and from the expansion of that system authorized by the Board."

Discussing foreign operations, the Board pointed out that in the three-year period revenue miles flown increased 101.66%; revenue passengers 112.69%; pounds of mail 213.46%; pound-miles of mail 487.53%; express pounds 115.08% and express pound-miles 252.54%.

Urge More Planes

In June 1941, CAB stated that it informed the chairman of the commercial aircraft priority committee of OPM that "to meet the full traffic demands of 1942 on the routes now being operated would appear likely to require the further addition of from 80 to 140 aircraft . . ." However, instead of getting planes, CAB pointed out that the airlines have been losing equipment.

In asserting that the industry is financially able to undertake more expansion, the report pointed out that the net worth of the airlines has increased from \$24,427,500 on June 30, 1938, to \$55,564,918 three years later.

Where evidence introduced at hearings show that services applied for by companies not in existence when the Act was passed are required by public convenience and necessity and that such services, rather than some other applicant, would best serve the public interest, the routes will be awarded to the new carriers, the Board said.

Cites Export Case

It took pains to point out that it followed this practice in giving American Export Airlines a trans-Atlantic route, but when the Post Office "sought from the Congress an allowance in the air mail appropriation for mail payments to this carrier . . . the Congress specifically declined to make the necessary appropriation."

On Apr. 1, 1942, applications were pending from 21 new carriers covering 35,552 route-miles (including over 22,000 miles of air pick-up).

"The question of what portion of this proposed new route mileage will be approved depends, of course, upon the showing made in each individual case . . . The operation of much of the new route mileage which may be approved will depend upon the success of the Post Office . . . in securing from the Congress the necessary allowances for mail payments in the air mail appropriations."

"It is only required that there be no uneconomical, mushroomlike growth and that there be no wasteful competition, factors which are inconsistent with the requisite showing of public convenience and necessity."

TCA Opens Service

Trans-Canada Air Lines on May 1 opened service between Moncton, N. B., and St. John's, Newfoundland. About 400 lbs. of air mail were handled on opening day, of which 85 lbs. originated at U. S. Army bases.

Airline Personalities in the News



HARRISON

George Harrison has been named terminal manager for Northwest at PD. He was formerly station manager at IC. Robert B. Burnett, former CAA air carrier inspector in New England, is now superintendent of maintenance for Mid-Continent, succeeding Paul W. Hawkins, resigned. R. V. Carleton has been appointed Braniff's chief pilot, succeeding R. S. Shrader, now in the Air



BURNETT



CARLETON



BROWN

Forces. J. M. Brown is Colonial Airlines' new superintendent of operations. Charles A. Smoot, formerly executive vice president of the Fourth National Bank of Wichita, has been named assistant to the president of Continental. The company also announced appointment of Ray Johnson as assistant superintendent of maintenance.



SMOOT



JOHNSON



SHATTO

Stanley R. Shatto has been promoted by Continental from superintendent of maintenance to vice president-engineering-maintenance. Walter J. Addems, formerly chief of flying for United's eastern operations, has been promoted to director of flight operations for the entire system.



ADDEMS



BISHOP

E. H. Bishop, formerly Delta's ctm in KX, has been shifted to a similar position in BH, succeeding Charles P. Knecht, who has been promoted to western district traffic manager. Kenneth S. Ward, formerly Delta's ctm in AG, has been named to the newly-created post of eastern dtm, with headquarters in AG. John J. Farmer has been named assistant manager of reservations service for DV-NY.



WARD



KNECHT



FARMER



WOLIN



STABLES



WEST



EVANSON

S. Roger Wolin has taken charge of Pan Am's western division public relations. Gordon Stables has been named dtm in YZ by United, while Fred Evanson has taken a similar position at DA. Charles West, dtm for Western in LA, is broadcasting an aviation program, "Wings Over the West," on KFAC, Los Angeles, every Monday night.

New TWA Appointments



FRITZ

L. G. Fritz has been given leave of absence as TWA's vice president-operations to go on active duty with the Air Forces as chief of operations, Ferrying Command.



COLLINGS

John Collings, TWA operations superintendent, has been elected vice president-operations. H. H. Gallup was elevated to Collings' former position, and Ormond Gove succeeds Gallup. Ray Wells has been appointed chief pilot, eastern division, replacing Jack Zimmerman, now on active duty with the Air Forces.



GOVE



WELLS



ZIMMERMAN



GALLUP



FLEMING

Clarence Fleming, assistant to the chairman of the board and assistant secretary, has been named a vice president of TWA, with headquarters in WA.



RUSS

A. W. French has been appointed assistant mail-express traffic manager, with KC headquarters. Eastern, central, and western mail-express regions have been established, headed by S. E. Russ, W. H. Pluchel, and R. M. Payne.



FRENCH



PLUCHEL



PAYNE



WINCHELL



HARRIGAN

Jim Harrigan, formerly dtm at AB, has been shifted to a similar position in WA, succeeding Robert S. Littell, resigned. John Winchell, traffic representative in LA, succeeds Harrington at AB.



FLEETWINGS

*builds planes of stainless steel
to train tomorrow's squadrons*



PILOTS to fight America's future sky battles get thorough training by the U. S. Army Air Forces in this gleaming new Fleetwings basic trainer . . . the world's first military airplane built principally of stainless steel!

Specifications of the BT-12: span, 40 feet; overall length, 29 feet, 2 inches. Powered by a 450 h.p. Pratt & Whitney engine.

This flexible, sturdy ship is just one example of Fleetwings' pioneering. Many new techniques for both fabrication and assembly have been developed by Fleetwings engineers . . . making for higher output per man-hour. **Result:** Fleetwings, the world's leading manufacturer of stainless steel airplanes and structural parts, is keeping ahead of production schedules on vital war contracts for both

aluminum-alloy and stainless-steel parts.

With tomorrow's designs already on its drafting boards, Fleetwings is building planes and parts in ever-increasing quantities, today!

★

FLEETWINGS

Incorporated

BRISTOL • PENNSYLVANIA



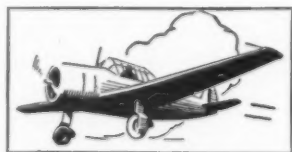
NEW BUILDING: Fleetwings is growing faster . . . and far more scientifically . . . than Topsy! Recently, a new plant was added that vastly increases Fleetwings' productive capacity. This new one-story building is 100% blacked-out . . . illuminated with fluorescent lighting, and so designed that it can readily be quadrupled in size. This plant houses the latest "edition" of the straight-line-flow production system that has enabled Fleetwings to keep ahead of schedule on warplane wings, control surfaces and hydraulic equipment.



"FEMME FATALE": She inspects stabilizer ribs made by Fleetwings for the manufacturers of high-speed fighters. Her skill and the diverse skills of the many ladies-in-overalls at Fleetwings are helping to get warplanes in the air faster. . . . These girls are "femmes fatales" indeed—fatal to the Axis!



WAR ON WASTE: Every Fleetwings employee has enlisted in the campaign to "Collect Scrap and Beat the Jap!" In each department at Fleetwings are colored containers for the collection of scrap metals of all types . . . a specially colored container for each category of scrap. All scrap is collected daily, baled together and shipped to smelters for reprocessing into virgin metal.



NEW CONVEYOR SYSTEMS: One new Fleetwings' conveyor system now speeds aircraft parts through the painting department, another through the spraying and doping departments. Still another conveyor system has been developed by Fleetwings engineers for automatic degreasing, infra-red-ray drying, and application of primer coats on sub-assembly parts. Results: Higher production, better paint coverage, lower cost.

"KEEP 'EM FLYING!"



Incorporated

BRISTOL

PENNSYLVANIA

Author Claims Freedom of the Air is Unlikely

IT IS UNLIKELY that a greater degree of freedom for international air commerce on a world-wide scale will be achieved in the foreseeable future, according to Oliver J. Lissitzyn, author of the new volume *International Air Transport and National Policy* (Council on Foreign Relations, New York, \$5).

"The establishment and operation of regular air transport lines require the consent of every state flown over," the author said. "The power to withhold such consent is used by most national states as a bargaining weapon to their own advantage. Air transport relations between nations frequently follow the trend of their general political relations."

He concluded that "internationalization of air transport is not likely to come without internationalization of military and political power."

Concerning the much-discussed question of subsidies, Lissitzyn stated that owing to political considerations, self-support of air transport in most of the important countries "has ceased to be an immediate objective, and is not likely to be achieved in the near future."

Asserting that air transport has become an instrument of national policy and that its importance as such is growing, the author said that American air transport effort in the international field must be directed toward three main objectives:

(1) the economic, cultural and strategic consolidation and development of the Western Hemisphere, and its dependencies, in a direction advantageous to the U. S., (2) the prevention of the establishment or maintenance in the Western Hemisphere of non-hemisphere air transport interests threatening the military, political or economic interests of the U. S., and (3) the development and control of the air transport links of the hemisphere with all other parts of the world, for purposes of peaceful intercourse as well as for strategic advantage.

Air transport, Lissitzyn said, "makes distances less important and reduces natural obstacles to intercourse among nations. Thus it tends to increase the effective size of political units and to intensify the struggle for survival among states and peoples. In the future it may aid in the establishment and maintenance of a world hegemony by a state or combination of states, thus putting an end, temporarily or permanently, to the international struggle for survival in its present forms."

In the foreword of the book, Edward P. Warner, member of the Civil Aeronautics Board, pointed out that "the total amount of money that the several powers are devoting, each month, to the production of bombing and combat aircraft exceeds the total amount that has been spent on aircraft for air transportation service in the 20-odd years since air transportation's first feeble beginnings."

"Air transportation itself has now



Link Attachment: L. H. Hagie, left, and L. H. Mouden, right, first officers of Mid-Continent Airlines, have invented the wind simulator attachment for a Link Trainer shown above. The device employs the principle of a moving pen traveling at a definite rate to correspond to the "wind" desired. The inventors claim it can be made of non-essential materials, to sell for \$200 on a commercial basis.

to be appraised, and to prove its right to survive during the war, by the universal test of its contributions to victory."

The return of peace, Warner said, "will not simply restore the conditions under which air transport existed before 1940. The dangers of a misuse of airpower have become so apparent as to make it certain that the victorious nations will adopt new controls, to the end that future aggression may be unable to avail itself of civil aviation either as a direct instrument of aggression or as a blind."

MCA Elects

Mid-Continent Airlines' stockholders have re-elected the following directors:

John S. Wynne, chairman, Washington, D. C.; J. W. Miller and Milton McGreevy, Kansas City; W. W. Howes, Washington, D. C.; J. A. Zock, New York; Montgomery Thrall, San Francisco; George F. Ryan, St. Louis; G. D. Murdock, Los Angeles, and Theodore N. Law, Tulsa.

The directors re-elected the following officers: Miller, president; J. C. Collins, vice president, treasurer and secretary; Howes, vice president, and C. A. Wicks, assistant secretary and assistant treasurer.

Moved Lately?

In order to prevent delay in the receipt of your copy of *AMERICAN AVIATION*, please notify us promptly of change of address. If possible, send notification 15 days in advance of effective date of change. Such notice should include the former as well as the new address.

Army Takes More Planes

(Continued from page 1)

flown in contrast to an even sharper cut in amount of equipment.

Most important decision reached was on air mail—priority passengers will have preference in payload. Air mail ranks far down the list on priorities with the result that it will not, as heretofore, dislodge passengers; the reverse will be true.

Air express in the direct war effort will rate high, but ordinary air express follows war passengers, mail and express.

Contrary to newspaper headlines, the Army has not "taken over" the airline companies. Complete assurance has been given to the companies that regardless of equipment requisitioning, all airline route franchises and the private entities of the companies, will be fully respected so that resumption of service is assured when the equipment emergency is over.

Coincident with curtailment of commercial services, the airlines have been given more and more war work for the Army with every company participating to the full extent of its ability.

Schedules of the restricted airline system were being worked out in Chicago May 19 and 20 and will have been announced by the time this issue reaches its readers.

Suspension of numerous routes not considered important to the war effort was ordered on May 15, but air service was being maintained to all parts of the country. Short-haul routes were ordered stopped and Eastern Air Lines took the lead in suspension of this type of service when it ended on May 20, 21 "merry-go-round" trips between Washington and New York, leaving only eight trips and all of these being through schedules to the south.

Sleepers Dropped

Immediate results of the curtailment throughout the country were: meal services were either eliminated or cut to "coffee and cookies"; all sleeper service is suspended with DST equipment being converted into cargo planes; early discontinuance of the sale of round-trip tickets, elimination of all discounts (including government discounts) and probable elimination of the 15% scrip.

All "luxury" features were being eliminated in order that all available payload may be used. A

stringent priority system is being established with an indication that the bulk of air passengers from now on will be those with priority clearances.

A large number of airline men were joining the Air Ferry and the Air Service Commands of the Army Air Forces and other transport set-ups within the Army. It seemed clear that the Army will rely more and more on trained airline personnel for many of its transport operations, although many important officials are remaining at their posts to direct the cargo operations which the airlines now have under Army contract.

Adjusts Quickly

On the whole the industry was adjusting itself quickly to a wartime footing although each company was faced with a morale problem in the face of the War Dept. orders and erroneous newspaper articles. The industry was by no means disintegrating even though it is moving through an important period of change.

The entire air transport situation remains in a "fluid" state and is expected to remain unstable for the duration because of emergency military requirements for personnel and equipment. But it seemed clear that even though the government may "take over" the airlines at a later date, and even though service is still further curtailed, that the government moves are dictated purely by war emergencies and that basically the industry will not be disturbed to the point that it cannot resume when peace comes.

Small airlines were hit hardest on equipment. Several were left with only one or two airplanes. Long-haul transcontinental schedules were least affected although curtailment was ordered.

Presidential Order

The War Dept. acted on orders from the President, with the Civil Aeronautics Board playing an important role, in cooperation with the Post Office Dept., in stretching remaining equipment to serve the greatest good.

A campaign by the government for the average public to travel by train, if it must travel at all, and to use air mail only for important war-time communications, is believed in order.

The War Dept.'s announcement was released on Friday, May 15, the same day airline officials arrived in Washington to hear the government's program.

It had earlier been expected that considerably less than 165 airplanes would be left in service and that there would be important reshuffling of routes for the duration, but the latter fear failed to materialize. Every airline was left with at least a skeletonized service, and no major reshuffling of routes was indicated.

Airlines Placed on War Footing

(Following is the complete text of the official War Dept. announcement of May 15.)

IN ACCORDANCE with instructions which have been issued by the President, the War Dept. has taken steps to place the domestic airlines of the U. S. upon a wartime footing.

The plan about to be put into effect will utilize the commercial air fleet in three separate ways. A substantial proportion of the available flight equipment will be transferred outright to the Army Air Forces to be available for operation by Army personnel in the various Services and Commands. The airlines themselves will convert approximately 70 ships into cargo carriers, title to most of which will remain in the companies, to be operated by airline personnel under contract for the Air Service Command. The remaining ships, aggregating about half of those now in commercial service, will until further notice continue to be owned and flown by the airlines, but will be considered always available for emergency military missions.

All routes and services not regarded as essential to the war program will be terminated. Announcements will be made shortly of the schedules, carefully prepared by the Civil Aeronautics Board, which the various lines will operate in accordance with this policy. Air travel vital to the country's needs will continue, subject to a strict system of priorities to be enforced through agencies in various centers in different parts of the country. All persons who can travel by train are to do so, except in real emergencies. Merely because an individual is a member of our Armed Force, or is engaged in war work, will not, in itself, entitle him to the use of air transport.

While air mail will be flown for the present over the new routes to be operated by the airlines, it may become necessary to curtail this service still more at a later date.

The entire plan follows the intent of the law setting up the airlines as an element of national defense and has been drawn up for the purpose of further utilizing in the war effort the equipment of the airlines and the valuable experience of their trained personnel. The War Dept. is confident of the complete cooperation of both the carrier companies and the general public in putting it into operation promptly and effectively.

ATA Silent

Even in the face of misleading and injurious newspaper headlines saying the airlines were "seized" by the Army, the Air Transport Association failed to issue a statement of any sort clarifying the situation or even telling the nation that the industry was supporting the government 100%.

Whether single-engined equipment would be used for flying air mail on smaller routes was still under discussion. No concrete plans had been made but several lines indicated they would endeavor to follow this plan. It was understood the government favored the idea if equipment could be used that was not needed in the war effort.

Up to press time the only announcement of new schedules had been issued by Capt. Eddie Rick-enbacker, president of Eastern Air Lines. His statement follows:

"Due to the Army need for cargo and transport planes and the desire to cooperate to the fullest extent in the war effort it is necessary to eliminate the so-called 'merry-go-round' plane services between New York and Washington effective May 20.

"This curtailment will reduce schedules now in operation from 29 to a total of eight round trips daily.

"There will be four flights daily to Miami with connections to Havana, Puerto Rico, and both coasts of South America, via Pan American Airways System.

"Four flights daily to Atlanta with two continuing to the southwest, one to Brownsville and one to San Antonio via Houston with connections to Mexico, Central, and South America via PAA."

Of the 165 airplanes left in service, all are Douglas DC-3 21-passenger planes except for 10 Lockheeds. All sleepers were taken for cargo work. Altogether the May 15 requisitioning took about 90 airplanes out of commercial service, although some of these will be operated by the same airlines under Army contract.

Inland Mail Rate Of 39.68c Proposed

CAB has ordered Inland Air Lines to show cause why its air mail pay on AM28 and AM35 should not be 39.68c per airplane mile. The company now receives 33 1/3c on the former route and 33c on the latter.

The new rate, which would become effective as of Aug. 6, 1941, would apply to months when average daily designated mileage did not exceed 4,528 miles, and would be paid for a base load of 300 lbs.

Baker to War Dept.

George P. Baker, vice chairman of the Civil Aeronautics Board, has been temporarily assigned to the War Dept., detailed in the Office of the Quartermaster General.

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The B.F. Goodrich Airplane of the month

CURTISS WAR HAWK

FROM THE ROAD TO MANDALAY to the frigid tundras of Russia, the Curtiss P-40 type fighter has turned in a record performance for the United Nations. And it is only natural that this bullet-swift pursuit bears the Curtiss name. For, since the days of the "pusher," Curtiss-Wright has been a leader in aviation.

Other members of the Curtiss family now winning their service stripes for Democracy include the Navy's "Hell Diver" dive bomber and the huge C-46 transport. B. F. Goodrich salutes Curtiss and nominates the War Hawk, newest Curtiss pursuit, as "Plane of the Month."

The Army flies with
B.F. Goodrich
FIRST IN RUBBER

B.F. GOODRICH RUBBER RESEARCH FOR THE

Aviation industry



AMERIPOL

...our synthetic rubber that is serving America now!

UNCLE SAM'S challenge is to "Keep 'em Flying." And that means dozens of rubber or synthetic rubber parts *must* be available. B. F. Goodrich is pleased to report on the contribution our own butadiene synthetic rubber, known as Ameripol, has already made, to help the Industry meet that challenge.

For many products, Ameripol has proved far superior to natural rubber for aeronautical accessories. Ameripol's resistance to gasoline and oil, for example, has made it ideal for airplane hose, hydraulic seals, and other accessories where natural rubber tends to rot and disintegrate.

The following chart, which illustrates the relative properties of Ameripol and natural rubber, immediately makes plain the advantages of switching to Ameripol, first in aviation synthetics, for many items:

Properties	Synthetic Ameripol	Natural Rubber	Properties	Synthetic Ameripol	Natural Rubber
Resistance to:			Range of:		
Abrasion	★		Elasticity		★★
Acids and Alkalies	★		Elongation	★	
Aging	★★		Hardness	★	
Heat	★★		Permanent Set	★	
Oil, Grease & Petroleum Solvents	★★		Tensile Strength	★	
Oxidation	★★		Reaction to:		
Tear	★★		Sub-Freezing Temperatures		★★
Code: ★ Equals ★★ Excels					

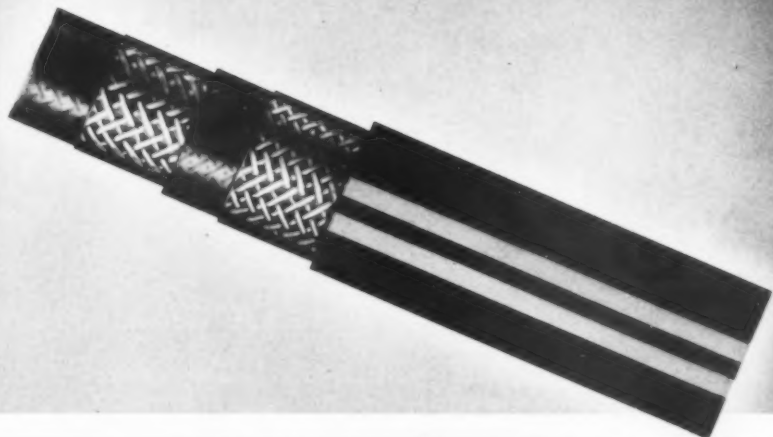
Ameripol, a product of 16 years' research in B. F. Goodrich laboratories, was first announced publicly in June, 1940, as a practical substitute for natural rubber in tires. On the right-hand page are some of the products made with Ameripol that are now *in the air!* We are proud of this contribution and we pledge our continued efforts to "Keep 'em Flying" with natural and synthetic rubber parts. Write for descriptive literature. B. F. Goodrich, General Offices, Akron, O.

MAKERS OF B. F. GOODRICH TIRES AND OVER 80 RUBBER AND SYNTHETIC RUBBER PRODUCTS FOR AIRPLANES



Ameripol

SERVES WITH THE AIR FORCE



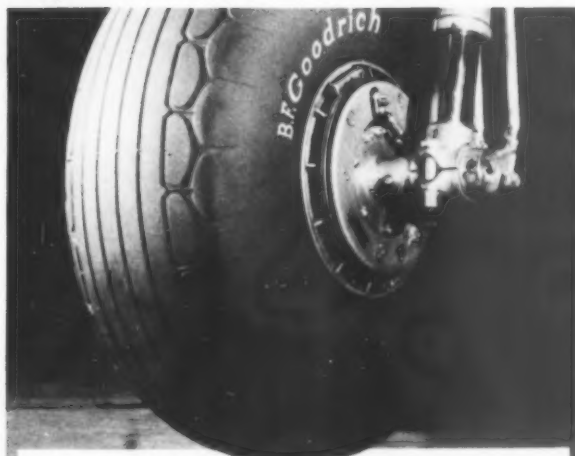
GASOLINE AND OIL HOSE.

Airplane hose serves in a number of important products on United States fighting planes. Proved by performance, Ameripol synthetic rubber was used for B. F. Goodrich fuel and oil hose many months before the war emergency brought synthetics to their present prominence.



GROMMETS ★ HYDRAULIC SEALS ★ GASKETS.

Perhaps they look trivial. But they're vital to a plane's performance. Made with Ameripol, they offer: low oil absorption (swell does not exceed 6%)—high resistance to wear, heat and sub-zero temperatures—will not corrode metals—can be accurately molded to desired precision tolerances.



THE EXPANDER TUBE

of a B. F. Goodrich E. T. Brake is also made of Ameripol. When this tube is inflated with braking fluid, it expands, forcing the brake lining blocks into uniform contact with the revolving brake drum attached to the plane wheels, and the plane comes to a smooth, safe stop.



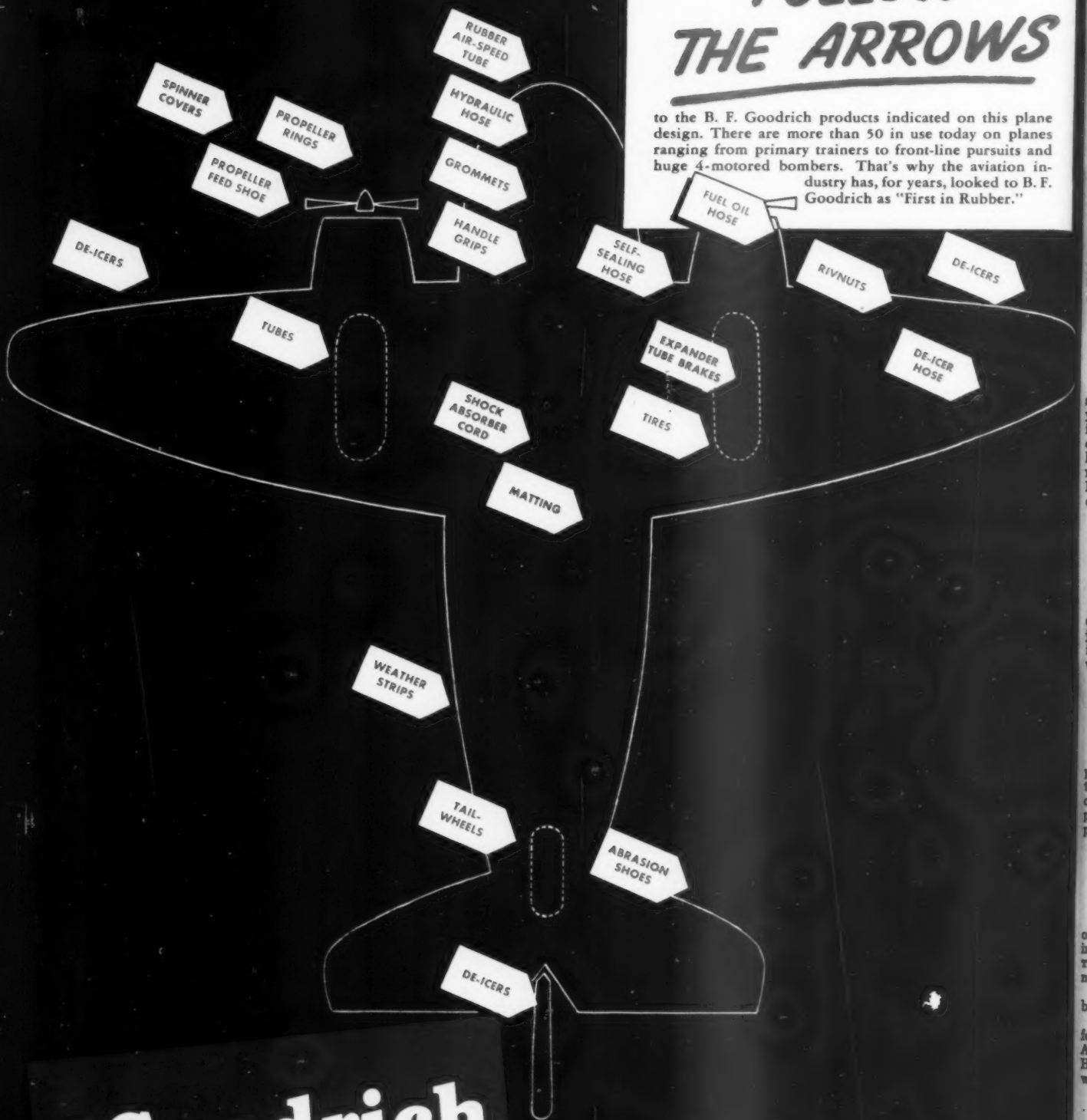
In war or peace

B.F. Goodrich

FIRST IN RUBBER

FOLLOW THE ARROWS

to the B. F. Goodrich products indicated on this plane design. There are more than 50 in use today on planes ranging from primary trainers to front-line pursuits and huge 4-motored bombers. That's why the aviation industry has, for years, looked to B. F. Goodrich as "First in Rubber."



B.F. Goodrich

**GENERAL OFFICES
AKRON, OHIO**

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Letters

... But it Won't Take Off

Jacksonville, Fla.
Most of us don't often take the time, as we should, to give credit where credit is due, so this is my time to tell you what a grand job I think you have done. Your editorial policy has been straightforward and to the point. You did not rant and rave about the greed and selfishness of everyone in connection with our war effort, and then allow your actions to belie your words. Instead, you hit the nail on the head every time for the benefit of the entire industry, and sometimes, I think, not without placing yourself in a position that might have incurred the enmity of some of our 'politicos.'

G. T. BAKER, President
National Airlines

Denver, Colo.
Permit me to say at this time what so many others have previously told you, that I feel AMERICAN AVIATION is a creditable and distinct asset to our great industry. I have never known it lacking in reader interest nor in things we should know about. Best wishes for the continued success of your magazine.

P. J. CARMICHAEL
General Sales and Traffic Mgr.
Continental Air Lines

Boston, Mass.
You certainly have my heartiest congratulations on the marvelous job which you have done for the industry over the years. Best wishes for your continued success.

S. J. SOLOMON, President
Northeast Airlines Inc.

Houston, Tex.
Although not actively flying at the present time, I am still a subscriber to AMERICAN AVIATION and surely congratulate you on the splendid progress and development of your publication.

WILLIAM ROCHFORD
Rochford Sales Co.

New York, N. Y.
Several of the boys that I know of with American Airlines, including myself, feel that AMERICAN AVIATION has turned out to be an Army magazine.

I used to read it cover to cover, but not any more.

I don't know how the other boys feel about it, but I get my fill of Army news every day in the papers. However, \$4 won't break me so will try it once more.

An American Airlines Pilot

Hinsdale, Ill.
Your magazine is the best damn one on the market—carry on!

DONALD PHILIP

Pittsburgh, Pa.
Your magazine has been a constant source of enjoyment to me and I feel that it's the best magazine in its field.

CHARLES E. CLARKE
TWA Inc.



INSTRUCTORS at American School of Aircraft Instruments, Glendale, Cal., have a new airplane similar to the Link Trainer in that it does everything but take off. The instructors use this new addition to their training facilities to demonstrate how various instruments operate when a plane is in level flight.

The plane can be made to roll, pitch, and yaw, and the instruments being checked in the craft at the moment indicate and read exactly as they would in a plane under actual flight conditions. Operation of instruments is effected through vacuum and hydraulic systems which respond to movement of the ailerons, elevators, and rudder, and to separate manual control.

After students have repaired or overhauled various instruments, those instruments, quite often an entire panel of flight instruments, or a Sperry Gyropilot and Directional Gyro, are installed in the plane. Then as the craft is operated to assume various attitudes of flight,



the students observe the accuracy of their work.

According to William J. Watkins, chief instructor at the school, use of the plane results in impressing upon students that instrument accuracy is in direct proportion to care and precision of adjustments and repairs, and provides advance practical experience that could never be obtained otherwise.

Hours vs. Efficiency

Cleveland, O.

Our greatest progress in the furtherance of our present war effort is not going to be by building more plant but by using more efficiently the plant we have. The greatest error we have made so far is that we think of production in terms of man hours rather than in terms of what that man in that hour can do.

When we begin to increase the efficiency of our present operations it will be a very simple thing to double our present production with the same number of man hours. We can inside of another few months, double that again if the efficient methods which the industrial geniuses know can be applied and are enthusiastically followed.

Man hours alone will never beat the Axis, as we are seeing. The efficiency possible by the application of industrial genius will.

J. F. LINCOLN, President,
Lincoln Electric Co.

WNAA Elects New Officers, Directors

MRS. GORDON WRIGHT of Tulsa, Okla., was elected new president of the Women's National Aeronautical Association at the 13th annual convention of the group in Kansas City, Mo., Apr. 24-25.

Other officers elected are Mrs. Cathryn Bush Aber, Los Angeles, Cal., first vice president; Miss Gladys Dallimore, Pueblo, Colo., second vice president; Mrs. R. L. Hahn, Tulsa, Okla., secretary, and Mrs. Matilda Miller, Topeka, Kan., treasurer.

New WNAA directors are Mrs. Richard Wilks, Salt Lake City, Utah; Mrs. L. E. Shumaker, Denver, Colo.; Mrs. Crockett Ellis, Memphis, Tenn.; Miss Jessie Ostrander, San Diego, Cal., and Mrs. Mildred Carney, Shreveport, La. Retiring president, Miss Marion M. Newell of Kansas City, Mo., was elected governor at large.

Colorado Springs, Colo., was voted as the 1943 WNAA convention city.

Calendar

(Events listed below are subject to cancellation without notice)

JUNE 8-10—American Society of Mechanical Engineers, Semi-Annual Meeting, Cleveland, O.

JUNE 19-20—8th Northwest Aviation Planning Council, Spokane, Wash.

JUNE 19-20—National Aeronautic Association, Annual Meeting, Advertising Club of New York, New York, N. Y.

JUNE 22-26—American Society for Testing Materials, 45th Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J.

OCT. 12-16—National Metal Congress and Exposition, Detroit, Mich.

Obituary

Col. Oliver Ferson

Col. Oliver Stevenson Ferson, 50, director of war organization and movement on the staff of Lt. Gen. H. H. Arnold, commanding general of the Army Air Forces, died of a heart attack in Washington on May 17.

Col. Ferson joined the aviation section of the Signal Corps when the U. S. entered the war in 1917. He completed the advanced flying school special observation course in 1927, was promoted to major in 1937, lieutenant colonel in 1940, and became a full colonel on Mar. 15 of this year.

C. J. Lucas

C. J. Lucas, of the sales department of Aircraft Steel & Supply Co., Wichita, Kan., died on May 17 in a plane crash near Wichita which also took the lives of Ben H. Miller, Washington correspondent for the Baltimore Sun, and William H. Knorr, Wichita warehouse operator. Lucas, veteran pilot who served in the Army Air Corps in the last war, was piloting the plane.

NAA Meets June 19-20

The annual meeting of the National Aeronautic Association will be held June 19-20 at the Advertising Club of New York, New York City.

NAPC Meeting Planned

The eighth annual meeting of the Northwest Aviation Planning Council will be held in Spokane, Wash., on June 19-20. Speakers on the program will include Army and Navy officers, as well as representatives from several airlines, the Civil Aeronautics Administration, private operators and community businessmen interested in making future aviation plans for the northwest territory.

American Aviation



The Independent Voice of American Aeronautics

Published the 1st and 15th of Each Month by

AMERICAN AVIATION ASSOCIATES, INC., American Building, Washington, D. C.
West Coast Office: Title Guarantee Bldg., Los Angeles, Cal.

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PUBLICATIONS OF AMERICAN AVIATION ASSOCIATES, INC.:

AMERICAN AVIATION: Subscription rates for U. S., Mexico, Central and South American countries—\$3 for 1 year; \$4 for 2 years; \$5 for 3 years. Canada—\$3.50 for 1 year; \$6.50 for 3 years. All other countries—\$4.50 for 1 year; \$9.50 for 3 years. Member of Audit Bureau of Circulation, Associated Business Papers Inc., and Advertising Federation of America.

AMERICAN AVIATION DAILY: Published six days each week except holidays, dispatched by air mail. A comprehensive newsletter covering daily developments in aviation. \$15 per month; \$85 for six months; \$170 per year. Group company rates on request. Service Bureau available to all subscribers. ROBERT H. WOOD, Managing Editor.

AMERICAN AVIATION DIRECTORY: Published twice a year, spring and fall. Complete reference data on administrative and operating personnel of airlines, manufacturers, accessories firms and their products, organizations, schools and local operators, federal and state government agencies concerned with aviation, and related aviation interests in the U. S., Canada and Latin America. Single copy, \$5; Annual subscriptions, \$7.50. Discounts on quantity orders. Next issue Oct. 15, 1942. DAVID SHAW, Managing Editor.

Fortnightly Review

(Continued from page 1)

million dollars (\$20,000,000,000 if your arithmetic will take you that far).

We have learned the meaning of *service responsibility* and your demands upon us have increased to the point where 27 employees are now devoted to a job that was started with a staff of four.

Important aviation news developed so rapidly that it could not be handled within the economic balance of a twice-a-month magazine. Top speed was required. Accordingly, AMERICAN AVIATION DAILY made its appearance Jan. 3, 1939, to operate at an adequate subscription rate without advertising. With a 4 pm. deadline, the DAILY flies by air mail overnight to all important points within the U. S.

With the aviation industry under forced draft, there was great need for some service that would keep up with a changing picture, listing perpetually the names of companies, key personnel, titles and addresses. To meet this situation we brought forth AMERICAN AVIATION DIRECTORY, classified, indexed, and brought up to date twice yearly as a working tool for the busy executive.

A Service Bureau, also, was organized to provide a speedy and accurate information source.

Today with our nation at war and building an Air Force of two million men, AMERICAN AVIATION accepts added responsibility in handling for publication an increasing volume of non-military information helpful to the Army and the aviation industry.

The past five years have wrought tremendous development in aviation. The next five will see perhaps even more significant changes as aviation spirals upward. AMERICAN AVIATION is geared to report and interpret the news of this great air age unfolding day by day throughout the world.

An Intelligent Approach

TWO PERSONNEL department heads of Curtiss-Wright Propeller Division in a Pennsylvania city are to be commended for handling Selective Service problems in an intelligent manner. Ernie Holmok and F. A. Ogden, the personnel men, decided that draft boards could make sensible decisions on deferments of needed men only if they had an idea of what propeller production was all about. So draft boards in communities surrounding the plant are being conducted on a two-and-one-half hour tour through the factory. It is reported that board members have been amazed at the exacting precision work required in the making of propellers. As man power requirements for the armed services becomes increasingly important, this plant tour idea strikes us as being built of common sense. There's nothing better than a first-hand view.

The Job Ahead

THE AIRLINES of the U. S. are going through a trying period of readjustment but there is no reason for hysteria, defeatism, or recrimination. The latest blow which came in the form of drastic curtailment of commercial service is not fatal. The individual companies still have their identities and franchises and there is no reason to believe that this status will change even though still more equipment may be requisitioned. The United Nations need transport planes more than the U. S. needs a full complement of airline service at this time. Valuable and seemingly essential as is the air transport industry to the war effort, there are times when the military needs are still greater. Anyone who is following the course of the war should not have to be reminded of the acute shortage of transport planes.

This is no time to cry out against the stupidities and lack of planning of the past. Old wrongs cannot be righted. The job before the air transport industry is to go to work without let-up on the cargo assignments contracted for by the Army. A few sacrifices now are worth many other alternatives of far worse nature.

The unfortunate part of the latest War Dept. move is the impression created by the newspapers that the Army "seized control" of the airlines. Why the Air Transport Association did not follow up the War Dept. announcement immediately with a statement assuring the government of 100% support and cooperation, and at the same time clarifying the industry situation, is another of those public relations mysteries for which ATA is becoming quite well noted. It would have been so simple to have cooperated with the government in letting the public know the true facts. Instead the public received an erroneous impression which the government had no intention of creating itself and the morale of the airline personnel was badly and needlessly hit. The "hush-hush" policy of ATA, which evidently has cloaked a multitude of other mysteries now being unveiled to the industry, has reacted most unfavorably.

But the job ahead is clear. Industry unity and complete cooperation is essential. Talking and legal verbalistics must be supplanted by hard work. Disheartening as curtailment may be, a world war makes many demands and peace and air expansion will come in due course. (See story on page 1).

Doolittle Does It Again

BEFORE the President pinned the Congressional Medal of Honor on Brig. Gen. James H. Doolittle on May 19, the word had pretty much gone the rounds that the irrepressible and incomparable Jimmy had led the bombing flight over Japan. Who else but Jimmy Doolittle, in fact, could have conceived, planned and carried out that spectacular and highly successful raid? Another stirring chapter has been added to the almost legendary history of one of the nation's greatest flyers, a daring pilot who has behind him a technical background and a life of genuine accomplishment. There are pilots and heroes, but there is only one Jimmy Doolittle and the nation can well be proud of him.

Bookshelf



VICTORY THROUGH AIR POWER, by Maj. Alexander P. de Seversky; Simon & Schuster, 1230 6th Ave., New York, N. Y.; 354 pp.; \$2.50.

A reading of Maj. de Seversky's fascinating book leaves no room for doubt that this is one of the greatest aviation books of all time. It is quite likely that the real contribution he has made will not be completely realized for years to come. Here is the most important book to come out of the war. Those who are skeptical in advance cannot remain skeptical for long.

Probably there will be many in military aviation who disagree with several of the Major's contentions and particularly in his analysis of the war to date. Only time will tell. But the book is thoroughly provocative, thoroughly challenging, and masterfully done considering that it is as fresh as today's newspaper headlines.

Perhaps the outstanding conclusion reached is that the great strategies of an air war may not be fully reached in this war. The Germans planned for quantity, they planned for certain restricted types of aerial warfare, but have been vulnerable as to long-range air action.

The Major has written a book which should be required reading for everyone in aviation—as well as for the lay public.

• **WIDER WINGS**, by Patricia O'Malley; Greytone Press, 40 E. 49th St., New York, N. Y.; 273 pp.; \$2.

This is Pat O'Malley's second book, and it is every bit as good as the first one. Purpose of both volumes is to explain the duties of the airline stewardess through the medium of fiction, and Pat,



O'Malley

who works in the Civil Aeronautics Administration's information division, does the job well.

In *Wings* for Carol, her first book, the authoress told the story of Carol's start in aviation with a large airline. In *Wider Wings*, Carol leaves the transcontinental company to set up a stewardess system for a smaller line. In this way, many of the problems of the stewardess organization, not explained in the first book, are covered.

This book should have even a wider appeal than the first, because the stewardess field is not as restricted as before. Because of the war most airlines have dropped the requirement that their stewardesses be registered nurses. In addition to prospective stewardesses, however, many airline employees and persons interested in aviation will find this volume worthwhile.

E. B.

• **ADVENTURE WAS THE COMPASS**, by Alma Heflin, with drawings by Martha Powell Setchell; Little, Brown & Co., 34 Beacon St., Boston, Mass.; 285 pp.; \$2.75.

The author—one of America's 250 women commercial flyers and test pilot for Piper Aircraft Corp.—and another girl, made an office-chair dream come true by flying a Piper Cub coupe to Alaska. The reader of this fresh-spirited chronicle will thrill at their adventures—the cross-country flight to Seattle, with stop-offs in Ohio for a "coke," in Montana for waffles and coffee; a boat trip to Ketchikan; then, on to Alaska.

In that cold but friendly country they discover that history was made only

yesterday, that Eskimos are friendly and fascinating, that telephone communications are a mental hazard, that roads are a speculation, that airports exist in the minds of contractors, and that the pioneers of today are the men who fly over and in and about our last frontier.

A full quota of amusing drawings fittingly illustrates this book that is packed with accurately-reported and entertaining incidents.

• **WHAT THE CITIZEN SHOULD KNOW ABOUT THE AIR FORCES**, by Lt. Col. Harold E. Hartney; W. W. Norton & Co., Inc., 70 5th Ave., New York, N. Y.; 218 pp.; \$2.50.

This volume is a survey of the air defenses of the U. S. as they exist today in the newly created Army Air Forces, in the naval air forces, and in the Marine Corps and the Coast Guard, now incorporated in the Navy.

The book attempts to take no sides on controversial subjects. It is simply an objective review of our airpower, including organization of the various forces, and training of enlisted men and officers.

A short history of the warplane and America's role in its development, and special chapters on air warfare, air defense and the question of a unified command high point the book. Some description of such subjects as aerial photography, gliding, parachutes, and balloons contribute to making the book interesting non-technical reading.

This up-to-date survey with its historical account of our air forces has been prepared by a man who has been associated with American military aviation since the time he was Commander of the First Pursuit Group of the U. S. Air Service in World War I. In the intervening years, Lt. Col. Hartney has been technical adviser on aviation to both governmental and private organizations.

• **AIRPLANE METAL WORK**, Vol. 4 and Vol. 5, by Alex M. Robson, Hadley Technical High School, St. Louis; D. Van Nostrand Co. Inc., 250 4th Ave., New York, N. Y.

Vol. 4 of this series of six is devoted to airplane pneumatic riveting. It is a basic textbook for the repair depot airplane mechanic, draftsman, inspector, engineer, template maker and sheet metal worker; also, the trainee in military training schools, airplane factories, private schools, government agencies, airline repair depots, public trade, technical and vocational schools and junior colleges.

Vol. 5 is on airplane sheet metal repair, intended for the same reader class as Vol. 4.

• **FLYING SQUADRONS—A Graphic History of the U. S. Army Air Forces**, by S. Paul Johnston; Duell, Sloan & Pearce Inc., 270 Madison Ave., New York, N. Y.; 235 pp.; \$3.50.

Rare and startling photographs are combined with authoritative text to tell the story of the Army Air Forces—how they developed, how they compare, and what their prospects are. Briefly but penetratingly the author tells the story of the early 20th century experiments and of what happened to aviation in the first World War. He shows what the position of our airpower was in 1919, and how that position changed in the '20s and '30s, experimentation, discouragement, retrogression, new ideas, organization, the attitude of Army leaders, of government leaders, of industry.

Finally, he presents the whole picture of our Army Air Force as it was constituted on Dec. 7.

He then gives data on the make-up



"Don't be alarmed, gentlemen—We're directly above Super Studios in Hollywood!"

of Army Air Force personnel, on training courses, on programs mapped out, on lessons learned from the Nazis and the British. Finally he presents the all-

over strategy of our military aviation, explaining where it is weak, what it must plan for, how it can be the key-stone to victory.

Forward, America— To Victory!

***** Let's not rant and rave all over the lot about the greed and selfishness of everyone connected with this war of offense being conducted, and then allow our actions to belie our words. Conversation will not win this war. Heroics of the dim, distance past of other wars, even if authentic, do not frighten our enemies or particularly impress our citizenry. Action is required and demanded at the far flung fronts all over the world, at the factories, at the shipyards, and of us in the AIRLINE INDUSTRY. Judge us by our actions.

NATIONAL AIRLINES, Inc.

G. T. BAKER, President

TO: AMERICAN AVIATION

May we—on this occasion—American Aviation's 5th anniversary—offer you our congratulations on a job well done and wish you all manner of success for the future.

R. (Dick) Leferink
President



Inland Air Lines

Separate 'Maintenance Airports' Suggested

Expert Favors Performing Airline Service
Work at 'Roundhouse', Divorced
From Passenger Terminal

By E. J. FOLEY

"WHAT'S an airport for?" was the way we started the conversation the other night as we sat in the terminal building of one of the nation's largest airports, waiting for a chance to get a ship out.

He was a 20-year man in the flying business and now the chief inspector for a major airline.

It was his question but it took the two of us to answer it.

As we looked around, we decided that an airport—the typical

modern municipal airport—is functional in a centipede sense. Its obvious fundamental purpose is to provide the air transport operators with areas for landings and take-offs.

But, branching out from this, the past 10 years have seen a dozen other considerations supplement this original function. It must serve a city's populace with high speed dependable transportation, so, you can't afford to have it a day's drive from the Merchandise Mart or the Penobscot Bldg. or the Empire State.

Then too, it's a graphic sales aid for air travel and in normal times, it must open its doors to the general public and let them stream out to vantage points to watch the dispatch and service offered by this, the newest form of getting places. It is the hostelry for the airline aircraft, which means it is the GHQ of hundreds of ground personnel—mechanics and office workers. The hangars, machinery and miscellaneous gear are a vital part of the airport of today. We ran through these few considerations and convinced ourselves that this chameleon-like versatility was too much to expect of the airport.

The first consideration, that of convenience to the metropolitan business area, means high property values, consequently high rentals. It may well mean also restricted areas. The fact that space is at a premium is evidenced by the filled land that makes up much of every coastal or shoreline airport. But even in filling, there are limitations. Considering these elements, we figure that the dollars per square foot land price and in turn, airline rental must be impressive, to understate the case. We took a look at the field from the public

relations angle, i.e., its function as a living sales campaign.

Watching the milling crowds, it was plain that the drawing cards were the uniformed salespeople—the engines' roar—the glint of the wing in the light from the building, the voice of the counter-dispatcher trying to find Mr. Jones, a Detroit passenger. These are the things they come to see and hear and these are the things that we should show them, but it occurred to us that, psychologically at least, there may be some things that the layman seeing but not understanding, might grab as a convenient excuse for balking and falling back into the "two-sleep" Pullman class.

But it was when we hit our third consideration, the hangars and the men that get and give the word in maintenance, that we first questioned the appropriateness of a function of the modern airport. The fact of the matter is that the airlines are about the only form of transportation that attempt to service and operate their equipment under the same roof, so to speak.

Airlines Could Profit

It struck us as being like the New York Central overhauling its locomotives and cars at Grand Central Station or the Cunard Lines giving their ocean-going palaces a heavy service at the passenger pier—while the travelers stand at a nearby window buying tickets. Can the airlines take a page from the general transportation book in this respect and profit by it?

True, the above comparisons may be somewhat exaggerated for effect—years of experience indicate that airline service at the terminal point is possible, practical, but give it a few minutes thought and see if you don't come to the conclusion we did: possible and practical though it may be, fix 'em and fly 'em at the same point doesn't necessarily represent the optimum in air transport economy.

How about an airliner roundhouse or drydock—a service airport, separate and distinct from the terminal? Pick a small town spot, 20 or even 50 miles from the city to be served—where land prices are not so dear. Lay runways for the lowest cost commensurate with serviceability not appearance. Build functional, low-cost hangars designed solely for the servicing and overhaul of aircraft and their components. Let utility be the prime consideration in every move and development that is made. This setup calls for no costly showplaces, no public attractions such



Maintenance Base: This new view of the plane overhaul hangar at United Air Lines' maintenance base, Cheyenne, Wyo., shows where propellers, control surfaces, and other parts are removed from planes, to begin their parade through the various shops. Mr. Foley recommends separate airports for maintenance work.

as supper clubs, bars, and similar concessions. The space available should be used to assure adequacy of shop space, cafeteria accommodations for employees, etc. The roundhouse, if we want to call it that, should be dedicated to the sole purpose—of maintaining the aircraft of the several operators concerned. It would be a long step in the direction of decentralization, a practice proven valid by the master production expert, Henry Ford and we figure that physical separation of these two airport functions, public-passenger service and maintenance can be of appreciable advantage to both.

More Runway Area

Under such a split, the terminal becomes the public hub. The elimination of much of the hangar space from the field leaves us with more high-cost area for runways, the prime need. Or if we assume that little gain in runway could be realized, why not carry through to completion the spirit of passenger service and provide a two- or three-story hotel?

This in our minds would be using the high cost land for an enterprise that can best bear the traffic, a high turnover activity. The public will continue to come to see the things that most attract them, the "romance of aviation." They will be served with the luxuries of supper clubs, dining terraces, bars and what have you. The airport will serve the airlines as a landing area and as a sales campaign—neither of these functions will suf-

fer an iota if we move the men and hangars a thousand miles away.

It's understood that servicing at the terminal cannot be entirely eliminated, but it surely can be reduced to terms of a single small hangar, six to 10 men and minor final adjustments on outgoing ships. This combination pooled by the operators should accommodate them all. Let's bear in mind a fact that we all admit in whole or in part: the amount of maintenance required on an airplane is directly proportional to the length of time available and the number of men that can be turned loose on it. We have all seen this in action and reminding ourselves of it now should make last minute maintenance with a very small staff seem more practical.

Such sights as emptied nacelles, stripped fuselages and partly disassembled wings are common to the air transport industry. You can see them through the hangar doors at any large airport. But what we wondered is if the layman passenger is psychologically prepared for such sights. It's admitted that the nation is daily growing more air-minded and that by the cessation of hostilities, we shall be an aviation-intelligent people, but do such sights without instructive explanation further the cause of air travel? We agreed that the terminal's sales appeal might even be enhanced by the transfer of maintenance activity to a more appropriate center.

The technique of operation under such a decentralized system will require the retention of some operations office space at the terminal field, direct telephone connection with the terminal field, possibly courier service between the two by means of instrument-flight training ships now owned by all major air carriers, etc.

Actual operations as we see them run something like this. The in-

(Turn to page 37)

WITH THIS ISSUE, E. J. Foley resumes his expert interpretation of the aviation equipment news field for AMERICAN AVIATION. This valuable feature will be contained in each subsequent issue of this publication.

Offset Rivet Sets

Aero Tool Co., Burbank, Cal., recently announced a line of offset rivet sets providing 7½°, 10° and 15° angularity. Micro-glass polishing of contact surfaces assures no harm to aircraft skin and a special cup-forging process assures long wear and precision.

Speeds Installation

By turning the wing of their wing style self locking nuts 45°, Boots Aircraft Nut Corp., New Canaan, Conn., has made the rivet holes more readily accessible as shown in the before-and-after illustration. Reducing maintenance



Before

After

time, this rework does not impair the performance efficiency of the fastener. Depending on size and style of nut being replaced, Boots maintains a weight saving of 18% to 66% is possible by using their all sheet metal nut.

New C-Clamp

Products Engineering Co., Los Angeles, Cal., now has in production a new high strength, 7800 pound breaking point, 1¼ inch C-clamp. This size is immediately available; other sizes require manufacture to order. The excess

strength built into this unit, 75% above Air Corps and Federal Spec requirements, is achieved by the combination of 100% drop forged manufacture and complete heat treatment of all parts.

Two Hand Tools

Two hand tools of interest to the metal shops of maintenance and overhaul bases have just been introduced by Aircraft Tools Inc., Los Angeles, Cal., the first is a Chip Chaser for cleaning seams between metal sheets after rivet holes have been drilled. It consists of a spring steel hooked blade and a firmly attached die cast handle. The second tool is a hook scraper for burring sheet stock edges; it is a V-end hooked tool which drawn along the sheet removes rough edges. Two sizes handle all thicknesses of sheet.

Spark Plug Test Units

Completely self-contained spark plug test units which produce their own electrical power supply and can be used anywhere in the field have just been introduced by Pacific Airmotive Division, Burbank, Cal. The units are equipped with a pressure type plug tester charged by a quick action hand pump. If desired, a gap-setting tool can also be supplied to permit resetting of satisfactory plugs and immediate return of these to service. The test kit is completely wired, ready for use and mounted in strong, handled carrying boxes.

Conduit Clamps

A survey of aircraft engineered tube clamps gave Tinnerman Products Inc., 2038 Fulton Road, Cleveland, O., data for the design of their 2980 Conduit Clamps which offer such features as: entire contacting area of clamp resists torsion, perfect circumferential fitting with tube and perfect contact throughout, clamp interlocking for double connections. Used with the new 6083 Bracket-type Speed Nuts, these clamps can replace the present ear-type bonding clamps and provide any desired angularity between tube and attaching angle, channel, etc. Manufacturer will supply samples.

Small Circuit Breaker

Aircraft electrical circuit protection is offered in "Aero-Magnette." the new small circuit breaker 2¾ in. long, 3 21/32 in. high, .865 in. wide weighing 4½ oz. as manufactured by Heinemann Circuit Breaker Co., 117 Plum St., Trenton, N. J. The unit has a maximum capacity of 50 amps and will carry circuits up to 28 volts. The magnetic trip with time delay gives delayed trip on harmless overloads such as passage of inrush current but provides high speed trip on shorts and dangerous overloads.

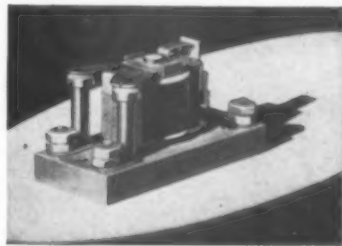
Folder Available

AVIATION STARTERS and Generators. Champion Aviation Products Co., 1702 S. Flower St., Los Angeles, Cal.; a folder on starters and generators for private training and commercial planes.

GE Relay Designed For High Altitudes

A STURDY, lightweight relay designed particularly for aircraft applications calling for operation at high altitudes under severe vibration conditions has been announced by the industrial control division of General Electric Co., Schenectady, N. Y.

Designated CR2791-A100A, the relay weighs 4½ ounces, is 3¼ inches long, 1½ inches high, and 1¾ inches wide and can be mounted



in any position. It is designed for mechanical frequencies of 5 to 55 cycles per second at 1/32-inch maximum amplitude (1/16-inch total travel) in any direction. Altitudes from sea level to 40,000 feet and ambient temperature ranging from -40 to 93½ C fall within the performance scope of the relay.

The relay has a current rating of 25 amp at 12 or 24 volts. The coil operates at 1.2 watts.

The entire relay has been built to meet Army Air Corps specifications.

Faster and Faster Finer and Finer!

MORE power—more range—more speed—MORE PLANES!
America, in her hour of urgent need, demands and gets the greatest air fleet man has ever visioned. And in producing those airplanes, American Industry, which first dared combine superfine quality with mass production, is grimly determined to seek ever higher standards of excellence as the pace grows swifter. Bendix-Scintilla Aircraft Magnetos, Spark Plugs and Ignition Switches will continue to become finer whenever human ingenuity and skill can better them. No matter how fast we must build them.

SCINTILLA MAGNETO DIVISION BENDIX AVIATION CORPORATION

The World's Finest Aircraft Ignition!

EQUIPMENT NEWS

Maintenance Airports

(Continued from page 36)

coming aircraft lands at the terminal field and disgorges passengers, mail, express and baggage. If it has accumulated only a little time since last service, the terminal crew gives it a once-over-lightly and it is ready for departure. However if it is due for service or overhaul, it is flown to the service airport after unloading. The scheduled work is done under potentially ideal conditions with no interfering distractions and after fueling, the ship is flown again to the terminal field.

Our idea for arranging for gassing at the service airport is to divorce the storage of so large a supply of inflammable and explosive fluid from a public metropolitan area. Of course, there will remain a need for fueling facilities at the terminal but only for "topping off" tanks or providing fuel for aircraft forced to return by adverse weather, etc.

On return to the terminal field, final adjustments are made as required and the aircraft is ready for loading and scheduled departure.

The question of who shall fly the ships between the terminal and service airports introduces several possible advantages of this type of operation. If we assume that the regular flight crew leaves the ship on arrival at the terminal and this would quite probably be the case, wouldn't it be advantageous to utilize this flight time, through good scheduling, for approach, landing and takeoff training for flight personnel under the instruc-



No Guesswork: Everything is tested thoroughly during each plane and engine overhaul and the most scientific methods are employed in determining performance. Here is a view of various test panels in the radio-electric department of United Air Lines' maintenance base at Cheyenne, Wyo.

tion of a check-out pilot as captain?

Further, the 20 minutes or half hour of flight time might be just enough to check landing gear plus other items which, unchecked may mean a delay or even a return. It would be a useful predeparture flight to catch any last minute items for the attention of the terminal service crew.

The just and vigorous campaign against "no-shows" was in full force this night, so our prolonged

wait gave us an opportunity to discuss the advantages that the service airport could offer airline personnel and running through them as we did, they looked pretty impressive.

The youth of the air transport industry combined with the detailed, regulatory atmosphere in which it has spent its childhood, preclude the possibility of the mechanic or white collar employee in this field getting into the upper salary brackets.

Working at one of our present municipal airports, the airline employee must (a) pay metropolitan area rent or land costs or (b) if he rebels against this, live so far from his place of work that the transportation cost may offset his rent saving. He chooses the high rent, let's say; for it, he gets a small apartment in a section that is cloud-deep with cliff dwellers, who, like himself, complain at length about the city's high cost of living. Dissatisfaction of this type costs the airline real money.

If, on the other hand, he has to fight his way 15 miles to work, he may be just as dissatisfied. The congenial, cooperative spirit of the small community agrees perfectly with the gregarious nature of most airline maintenance employees. The opportunity to have a yard and a garden, a workshop in the garage or basement, freedom for extra-shop or office activities can make for a satisfied worker. Add to this the lower rent, the lower cost of food, some of which he might grow, and we feel sure that the reflection of this satisfaction would appear in every man's work.

These are the thoughts that came to our minds that night while we waited for space—maintenance and passenger-public service can best



Shining Props: Three pairs of Hamilton Standard propellers which have been overhauled at United Air Lines' propeller department at Cheyenne, Wyo. They're ready to go back to their jobs aloft.

serve their individual purposes if they are separated. Economy need not be sacrificed because of the potential savings to both the operating corporate entity and the individual offered by the service airport. We didn't decide who'd build the roundhouse—two cancellations just at that point gave us seats—but it seems to me that a joint airline-city agreement might handle the deal or possibly an airline pool.

We parted with the understanding that I'd plant the seed of the idea in these columns and we'd see what crop we get. We are not trying to sell a bill of goods but just advancing an idea. Whether we're right or wrong, time should tell, but if you've already formed an opinion on our case as stated, I'd like to read your ideas.

IT'S SPEED THAT COUNTS!

A NEW MANUAL... Prepared especially for the AIRCRAFT INDUSTRY—Write today for this informative booklet, "Hints on Aircraft Sanding." It's packed full of helpful information—sent without obligation.

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New Standardization Agreements Reached at LA Engineering Meeting

Compliance Date On Tubing Specs Set at July 1

By JAMES L. STRAIGHT

West Coast Editor

MEMBERS of the National Aircraft Standards Committee, representing all U. S. prime manufacturers, concluded a two-day national meeting in Los Angeles last month during which leaders claim great strides were taken toward further standardization of aircraft materials and techniques.

Foremost accomplishment, because it strikes at a bottleneck of universal importance in the industry, was an agreement on aluminum tubing sizes and alloys.

The number of alloys currently being used in airplane aluminum tubing will be reduced from seven to three, and the number of different sizes from more than 2,400 to less than 200, thus eliminating a continuous demand on the part of the industry for more than 2,000 different tubing sizes now in production, so that stress can be placed on the output of newly approved basic sizes and alloys.

The standards committee is one



'American Aviation' Visits Douglas: Two representatives of 'American Aviation' recently paid a visit to Douglas Aircraft Co.'s Santa Monica plant to inspect war production. Left to right: James L. Straight, the magazine's western division manager; J. O. Moxness, Douglas engineer; John M. Rogers, vice-president-sales of the company; Wayne W. Parrish, editor of 'American Aviation'; Gordon Brown, director of cargo and transport sales; and William H. "Nick" Ball, assistant to the president of Douglas.

of several technical interests of the Airplane Technical Committee of the Aeronautical Chamber of Commerce, which consists of membership company engineering heads.

With the assurance of the aluminum producers of the country that production can be sharply increased by such standardization, the WPB's Aircraft Scheduling Unit, it is understood, plans to instruct tubing producers not to accept orders for alloys, tempers, or sizes not included in the approved standardized group, unless a specific deviation has first been considered and granted by the scheduling unit.

Automatic Increase

The proposed standardization is recommended by its sponsors as the only rapid means of automatically increasing the mill capacity of aluminum tubing. It was explained that there are definite prospects that by this method production can be increased as much as 20%.

Moreover, for the first time in the brief career of the standards movement, a compliance date has been set. It is expected that the above order will go into effect as of July 1, 1942.

Committee members gathered in Los Angeles with carefully prepared proposals based on projects assigned to member companies as much as a year ago.

During their long hours of deliberation, observers felt that one of the brightest chapters in the war effort was being written—a doctrine destined to submerge temporarily the individuality of airplane builders for the common good, in the same spirit as the airplane design pools.

Standardization of materials, parts, design, and production techniques has been perhaps the only respect in which the U. S. aircraft program has fallen short of enemy practice, some engineers said. As committee members gradually reach agreement on optimum specifications for each commonly used material or part, that disparity will be overcome, it is believed.

To Build Addition

CLEVELAND PNEUMATIC Tool Co. is reported to have awarded contracts for construction of an addition to its plant in Cleveland, to cost more than \$200,000 with equipment.

Enlightening the Draft Boards

Draft boards in communities surrounding the Pennsylvania plant of Curtiss-Wright Corp.'s Propeller Division are being conducted on two and one-half hour tours through the plant so they will be better able to judge an employee's eligibility for deferment.

Ernie Holmok and F. A. Ogden, Selective Service advisers of the plant's personnel department, initiated the plan.

"Many of the board members had never seen inside a machine shop and expressed amazement at the exacting requirements of our work," Holmok said.

Trumatic Corp Formed to Supplement Work of Russels Mfg. Co.

TRUMATIC CORP., 549 E. Illinois St., Chicago, has been organized to supplement activities of Russell Manufacturing Co., with factory and main office at Middletown, Conn. Raymond E. Dowd is president and chief engineer of the Trumatic concern and also chief engineer of Russell. Trumatic will manufacture aircraft shock absorbers and accessories; Russell manufactures aerorings, shock cord, starter cord, seat belts, shock struts, and heavy webbing. Dowd states that his connection with Trumatic will not in any way change his personal status with Russell nor conflict with its products and policies. Other members of the Trumatic organization will be announced soon.

Crowe Appointed

Appointment of Earl E. Crowe to be assistant general manager of Aircraft Industries Corp., and its associated companies, with headquarters at Glendale, Cal., was announced by Maj. C. C. Moseley, president.

In his newly-appointed position Crowe will serve as vice-president of Cal-Aero Academy, Mira Loma Flight Academy, Polaris Flight Academy, and Curtiss-Wright Technical Institute, contractors to the U. S. Army Air Forces, and RAF for pilot and mechanic training.

New Nazi Plane

Radio Berlin in mid-May said the Blohm & Voss company was making a new warplane—the Bv 141—for the Luftwaffe which has its engine and controls on the left wing and a closed cockpit for a crew of three on the right wing.

The plane is designed for "special use," Radio Berlin said, and has already achieved "great successes" on the Russian front.

It was said to be fast and maneuverable and armed with cannon and machine guns.

MORE HOURS "UPSTAIRS"

Franklin

Prop Blade Straightening Becomes Vital Wartime Art

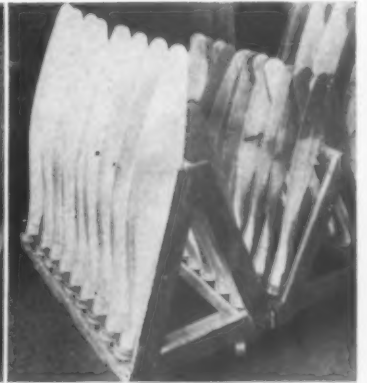
THE PROBLEM of propeller blade reconditioning having assumed an importance which it has never before enjoyed, blade straightening has become a vital wartime art and is now being practiced on a large scale by prop makers and specialists at military maintenance bases.

Repairability of propellers is a factor of paramount importance in wartime, an importance which can be judged from the fact that of all the props which are returned to DeHavilland Aircraft Co. Ltd., England, for repair—including blades which have been pierced by bullets, and blades and hubs which have been bent or damaged in crashes—

it is even possible to do this work without re-heat treatment."

At home, the U. S. pilot training program has brought about hundreds of minor cases of damage to trainer prop blades, placing a heavy demand on prop reconditioning service. Because much of the damage is of a relatively minor nature, it can be satisfactorily repaired in the field by a qualified repair station. Extreme cases of blade damage must be cared for at the factory or at a major propeller repair base.

Most cases of blade damage to Hamilton Standard propellers, both in this country and abroad, have been found to be repairable. Only blades which are bent very badly,



Photos Courtesy Hamilton Standard

Damaged Blades Reconditioned for More War Work
Over 80% of Damaged Props are Repaired and Returned

Industry's Backlog Jumps 75% Over Dec. 1941 Total

AMERICA'S aircraft industry has received such a large number of huge government orders since Pearl Harbor that by Apr. 1—two months ago—unfilled contracts totaled over 75% more than last December.

AMERICAN AVIATION told in its last issue how a current appropriation of \$8,761,000,000 for aircraft, engines, and parts had boosted total expenditures for U. S. aviation since June 1940 to \$35,557,000,000—23% of all war funds.

Col. John H. Jouett, president of the Aeronautical Chamber of Commerce, reporting details of floor space and working force, revealed that:

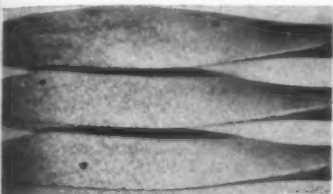
Between Dec. 1, 1941, and Apr. 1,

1942, the number of employees in the industry—plane, engine, and propeller plants—was increased by more than 30%.

During the same span, floor space in aircraft plants was increased by more than 10%.

In addition to the new floor space actually placed in production during the period, more than 30 new aircraft factories were either in final stages of planning or under construction, Col. Jouett reported.

More than 5,000 female workers were added to the industry's payrolls in the month of March alone, the announcement said. This brought to more than 20,000 the total number of women employed by the plane builders, a total destined for great multiplication in the near future.



Photos Courtesy Hamilton Standard.

Even Blades Which Have Been Pierced by Bullets Can Be Cleaned Up, Faired Out, Placed Back in Service

over 80% of the blades and 85% of the hub parts are repaired and returned to service.

Hamilton Standard Propellers Division of United Aircraft Corp. has for many years rendered the service of straightening blades for military services, the airlines, and private flyers. Damaged blades which have been returned to the factory have been repaired in most cases, sent back to the user, and have given many thousand hours' satisfactory service.

Commenting on the wartime importance and repairability of the forged duralumin type of blade, K. B. Gillmore, of the technical staff of the DeHavilland company—the sole licensee in England to build Hamilton Standard propellers—states in a recent article in *Flight*:

"Damage marks in the leading edges of dural blades caused by contact with the ground in a crash, or by abrasion from stones on air-dromes, can simply be smoothed out, and even bullet holes can be cleaned up and faired out, and the blades can be returned to service.

"Blades which have been bent can nearly always be straightened, and, if the bend is not too serious,

which are bent at the shank, which are badly torn, or which have had an excessive amount of material removed by contact cannot be reconditioned for service.

All others fall into one of two classifications: those which can be repaired by cold straightening, and those which are bent so badly as to require annealing, straightening, re-heat treating, and refinishing.

Practically all cases of cold-straightening can be handled in field repair bases. Propeller repair stations maintained by the U. S. military services are now in operation all over the world which can render this service satisfactorily, reducing the new-blade replacement problem.

Extreme cases of blade bending must be handled at the factory. Through annealing, the metal is softened to permit straightening, and through heat treatment the blades are restored to their original hardness and durability.

Blades repaired at the factory are balanced in sets in a master balancing hub, and are given other careful inspections to assure performance in the field which will be as satisfactory as that which might be expected of a new blade.

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AMERICAN AVIATION
ON ITS FIFTH ANNIVERSARY

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Throughout Boeing's 25 year record of outstanding achievement, Eclipse Aviation has initiated and produced, in cooperation with Boeing engineers, the many new aircraft accessories required for Boeing's program of building today the "airplanes of tomorrow."

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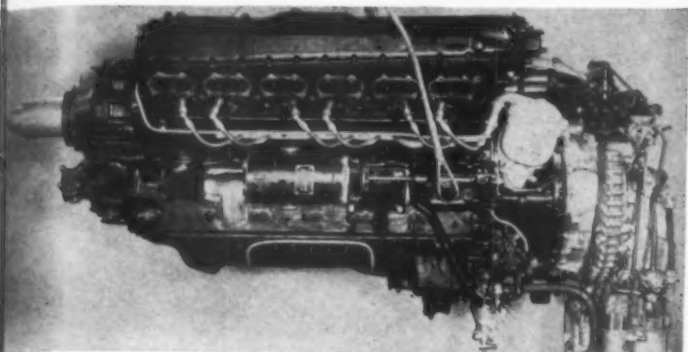
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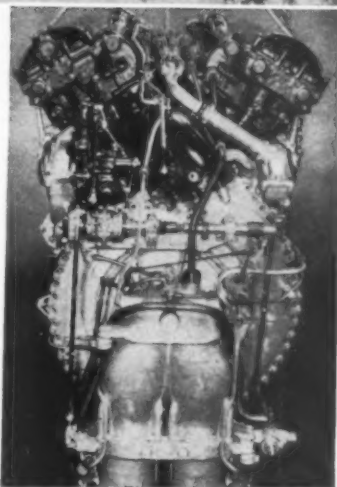
Amer

In Large Scale Production . . . The Engine of the Battle of Britain



THE MAKERS of Rolls Royce aero engines in England recently allowed a general press visit in their factories producing the Merlin XX engine which is credited with winning the Battle of Britain. Power for the RAF's Hurricanes and Spitfires is provided by the Merlin XX. The engine has a maximum power of 1,260 hp. at 12,250 ft. when low supercharge gear is used, and at high gear ratio produces 1,175 hp. at 21,000 ft. Weight is 1,450 lbs. Now in large scale production, the Merlin XX in one factory is made by 50% women personnel.

Packard Motor Car Co. is reported to be in "good production" on the liquid-cooled Rolls Royce Merlin in this country for use in the Curtiss P-40F.



Edo Model 56-7850 Standard Twin Float Gear
Installed on the Beechcraft AT-7A Advanced Trainer



Boeing's New Crew Trainer: The AT-15 crew trainer manufactured by Boeing Airplane Co. at Wichita, Kan., was specifically designed and equipped for the integrated training of pilots, co-pilots, bombardiers, navigators, and gun crews. The ship is constructed of steel tube with wood-faired, fabric-covered fuselage and plywood-covered wings and tail surfaces. The Pratt & Whitney engines are fitted with Hamilton Standard propellers.

American Aviation for June 1, 1942

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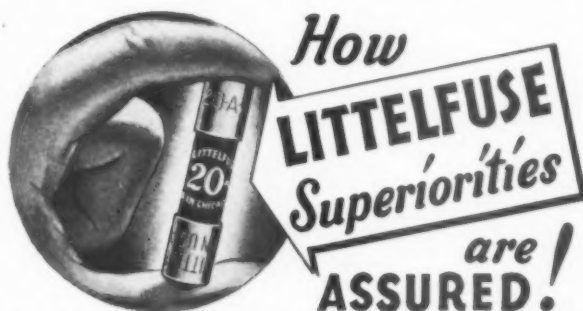
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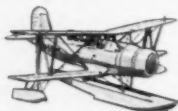
Since the Birth of Aviation



1926 - The Curtiss Falcon—O-1. First plane designed specifically for observation tasks and purchased in large numbers by the United States Army. Powered by D-12 engine.



1935 - The SOC-1, built for the United States Navy, shown here with land gear. Folding wings made it adaptable to limited storage space.



1937 - SOC's of this type, equipped with a single float and balancing wing tip pontoons, were placed aboard every battleship and cruiser of the United States fleet, the first model to achieve this distinction. They were launched by catapult.



1942 - The O-52, latest Army observation. High wing monoplane, excellent for vision. Slots and flaps make operation from small fields possible.

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New Industrial Councils Seek to Pool Ideas

SAE and API Promote Cooperation of Aero,
Automotive, and Petroleum Concerns;
AWPC Effects Free Interchange

By GEORGE N. SHUMWAY

ALTHOUGH there has been a high degree of informal interchange of ideas among producers of aircraft and allied items dating from the Boeing-Douglas-Vega bomber agreement of a year ago, two new industrial councils are now moving in their respective orbits to dissolve remaining barriers in the all-out production effort.

Newest of the voluntary organizations is the Cooperative Research Council, sponsored jointly by the Society of Automotive Engineers and the American Petroleum Institute. The CRC, which formally began operation last month, was created to centralize, correlate, and promote cooperative research activities of the automotive, aeronautic, and petroleum industries."

The other organization, the Aircraft War Production Council Inc., first announced in April (see AMERICAN AVIATION for Apr. 15), and having elected executive officers, reveals that its eight west coast member companies are interchanging facilities, materials, and "normally secret processes in a new and greater degree of all-out production."

AWPC

Essence of the Aircraft War Production Council in operation is speedy use of all regionally available facilities—at the point where they are most needed and at the moment they are most needed. "The coordinating method seeks to get the most out of machines, materials, manpower, and minutes," a council statement advises.

The council—formed by the Consolidated, Douglas, Lockheed, Northrop, North American, Ryan, Vega, and Vultee organizations on the west coast—has elected as president, H. H. Kindelberger, president of North American Aviation Inc., and as vice-president, Richard W. Millar, president of Vultee Aircraft Inc.

The AWPC's board of governors is composed of Harry Woodhead, president of Consolidated Aircraft Corp.; Donald W. Douglas, president of Douglas Aircraft Co. Inc.; Robert E. Gross, president of Lockheed Aircraft Corp.; LaMotte T. Cohu, chairman of the board of Northrup Aircraft Inc.; T. Claude Ryan, president of Ryan Aeronautical Co.; and Courtlandt S. Gross, president of Vega Aircraft Corp., together with Kindelberger and Millar.

First move of the council, after its incorporation in April, was the creation of seven functional groups in the fields of production, materiel, engineering and standards, transportation and housing, plant defense, accounting, and industrial and public relations.

Meeting monthly or semi-monthly, conditions require, the committees' main functions are to consider new production problems, to seek solution of these through group approach, and make recommendations to the board of directors for

CRC

Further defining its purposes, the Cooperative Research Council announces that it will endeavor "to direct cooperative research in developing the best combinations of fuels, lubricants, and equipment powered by internal-combustion engines."

It was also agreed that standardization of methods of test, specifications, and classifications shall not be within the province of the CRC. It is the intent of the council that such matters "shall be promulgated by appropriate existing agencies."

The committee organization under the council is at present as follows:

1. The Cooperative Fuel Research Committee which has been doing work on fuel utilization for 21 years.
2. A Cooperative Lubricants Research Committee, including in its work the programs of four committees, one of which is the SAE Aircraft-Engine Lubricants Research Committee.
3. A Cooperative Equipment Research Committee.
4. A CRC War Advisory Committee.

The council itself consists of 12 members appointed to serve for one year, six representing the SAE and six representing the API.

SAE representatives are B. B. Bachman, Autocar Co.; J. M. Crawford, Chevrolet Division, General Motors Corp.; William Littlewood, American Airlines; J. B. Macauley Jr., Chrysler Corp.; Arthur Nutt, Wright Aeronautical Corp.; and C. G. A. Rosen, Caterpillar Tractor Co.

API representatives are D. P. Barnard, Standard Oil Co. (Indiana); A. L. Clayden, Sun Oil Co.; T. G. Delbridge, Atlantic Refining Co.; R. A. Halloran, Standard Oil

On the Labor Front

ALLISON DIVISION, GENERAL MOTORS CORP., Speedway City, Ind.

NLRB has ordered an election among employees to choose a bargaining agent.

BELLINGHAM PLYWOOD CORP., Bellingham, Wash.

Employees voted 168 for IAW-CIO, 67 for AFL in an election held by NLRB.

BENDIX AVIATION CORP., Wayne, Mich.

UAW-CIO has been certified by NLRB as bargaining agent for production and maintenance employees.

CURTISS-WRIGHT CORP., Buffalo, N. Y.; Caldwell and Clifton, N. J.

NLRB election ordered on petitions filed by UAW-CIO, IAM-AFL and unaffiliated Associated Welders of Western New York, for Buffalo plane plants. In plants at Caldwell and Clifton, N. J., members of Propeller-Craft Inc., an independent union agreed to dissolve. Union funds, about \$5,000, will be donated to Army and Navy Relief.

ELECTRIC AUTO-LITE CO., Toledo, O.

Election for union affiliation of production and maintenance workers at Bay City, Mich., plant ordered by NLRB.

EX-CELL-O CORP., Detroit, Mich.

Company signed a revised agreement with UAW-CIO providing for general increase of 10c an hour, increasing yearly payroll by about \$2,000,000.

FAIRCHILD AVIATION CORP., Jamaica, N. Y.

NLRB has ordered an election for union representation.

FORD BOMBER PLANT, Willow Run, Mich.

Employees ask for \$1-a-day increase; \$100 war bond in lieu of two weeks vacation; non-stop production; equalization of tool and die wages with those paid in jobbing shops; equalization of all other wages with highest paid in industry; elimination of spread rates except on skilled jobs; elimination of geographical differences in wages; and increase in number of committeemen to handle grievances. Harry M. Bennett, Ford personnel manager, asked that present wages be frozen.

FRIGIDAIRE DIVISION, General Motors Corp.

Secretary Perkins certified to NWLB a jurisdictional dispute between CIO and AFL unions, involving 4,400 workers now making airplane parts.

GENERAL MOTORS PARTS DIVISION, General Motors Corp., Denver, Colo.

NLRB certified UAW-CIO as collective bargaining agent.

HALL MANUFACTURING CO., Cedar Rapids, Ia.

Employees voted for membership in CIO.

HARVILL AIRCRAFT DIE CASTING CORP., Inglewood, Cal.

Secretary Perkins certified dispute to NWLB concerning wages and union security.

NEW DEPARTURE DIVISION, General Motors Corp.

In NLRB election, employees voted 2,535 for UAW-AFL; 2,024 for UAW-CIO, no union 144.

RANGER AIRCRAFT ENGINES, Division of Fairchild Engine & Airplane Corp.

NWLB is giving the case a full hearing starting May 27.

SPERRY GYROSCOPE CO. INC., Brooklyn, N. Y.

U. S. Circuit Court of Appeals reserved decision on plea to quash NLRB directive disestablishing Brotherhood of Scientific Workers of America, held to be dominated by the company.

Directed by NWLB to accept UERW-CIO as bargaining representative. UERW claims a membership of about 1,500 out of 12,000 employees in six plants.

WRIGHT AERONAUTICAL CO., Paterson, N. J.

An election of 20,000 workers is to be held starting May 26, in five plants, to record their choice for union membership.

President, two other officials, and five council representatives of Wright Aeronautical Employees Association resigned and advocated UAW-CIO affiliation.

YALE & TOWNE MANUFACTURING CO., Stamford, Conn.

Company signed a new labor contract with IAM-AFL in which wages are boosted, according to AFL officials in some instances as much as 60%.

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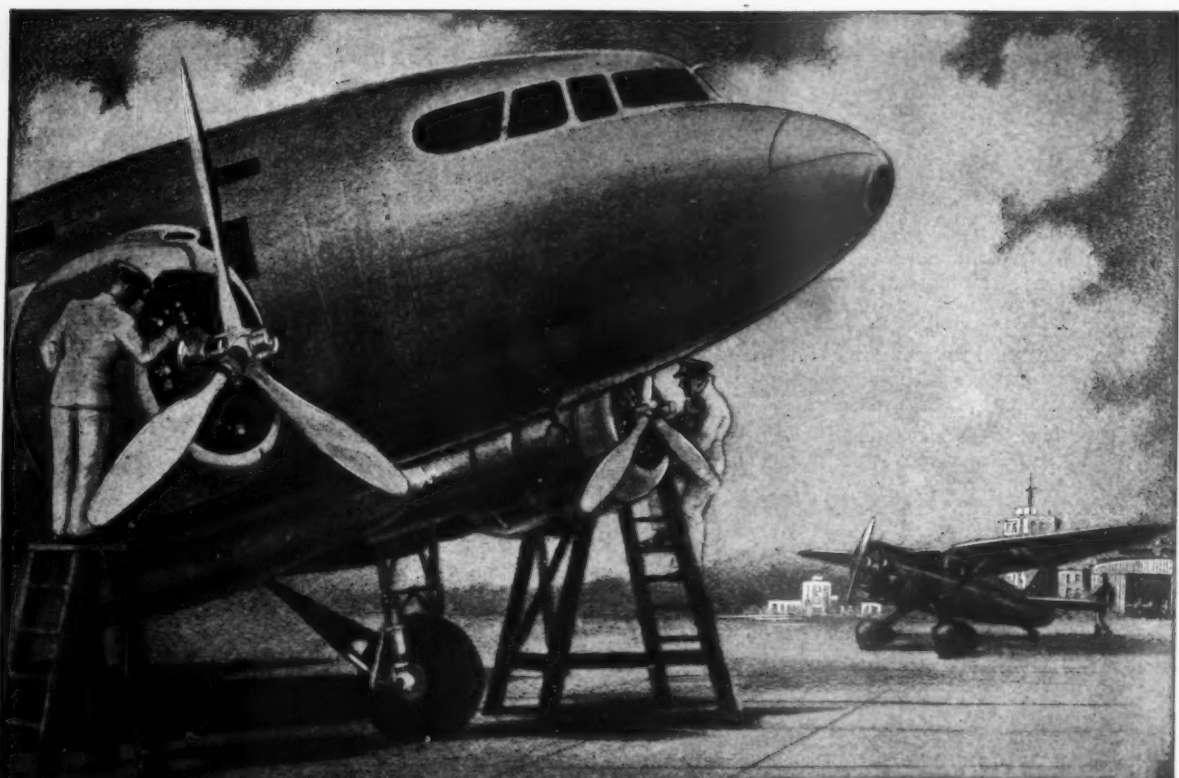
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(Turn to page 48)

(Turn to page 50)



The Fault Finders at Work...

ON the indicator in the Airport entrance-hall, the midday Southbound is scheduled to depart at 11-55 ack emma. It is now just 10-15, yet the great fifteen-place ship has already been out of its hangar for close on an hour.

When the time finally comes chocks are withdrawn and the twin engines roar into exultant crescendo for the take-off, a small gang of men in oil-smeared overalls will be watching with approving, confident eyes from the shadow of the control-tower. Those men are the 'fault-finders,' and their job is a vital one. Check, test and counter-check. Everything must be just **right**. The

safety and efficiency of the ship is only gained by long hours of unremitting toil.

In the VOKES laboratories this same unremitting toil has been directed to the problem of filtration, and today the Vokes technologists have just cause for satisfaction. The result of their research has been the introduction of **an entirely different principle** of filtration which gives the amazing percentage of 99.9% efficiency. This is as near perfection as it is possible for human endeavour to reach. These filters (available for air and for high and low-pressure oil systems) filter down to particles 0.00004 in. diameter.

The value of such absolute filtration cannot be over-estimated. Here at last is **pure** air and **pure** oil—bringing inevitably with them greater working efficiency, less wear and tear, **fewer** renewals, less trouble. We shall be pleased to answer all enquiries through our agents.

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Personalities in the News

Otto R. Stocke, who for the last few years has been located at the Nashville Division of Vultee Aircraft Inc. as chief financial officer, recently was made assistant to D. I. Carroll, vice president in charge of all Vultee production.

William L. Wilson has been named director of industrial relations of Republic Aviation Corp. to head the new industrial relations department, supervising all personnel, employment, training, and public relations activities of the company's plants. Thomas W. Macdonald has succeeded Wilson as director of public relations. E. Trevor Hill and Lewis M. Tansky have been added to the company's public relations staff.

A. L. Kress, industrial engineer who has most recently been consultant to the member companies of the Aeronautical Chamber of Commerce, has joined Republic Aviation Corp. with the title of assistant to the president



Kress

Hughes

Grant

Lehman

Allan S. Lehman, a partner of Lehman Brothers since 1908, has been elected a director of Studebaker Corp.

Officers of Globe Aircraft Corp., Ft. Worth, Tex., are now listed as follows: John Kennedy, president; C. D. Reimers and William Viner, vice presidents; George P. Hill, treasurer; Edwin H. Jackson, secretary. Directors, in addition to officers, are A. B. Wharton Jr., R. N. Webster, Fred Bowen, and Harry Brants.

P. N. Jansen, general factory manager of Curtiss-Wright Airplane Division, has been named director of manufacturing. John Lee, assistant to Jansen, is assistant director on tooling and manufacturing processes; W. A. Schanne, assistant to the general factory manager, has been named assistant to the director of manufacturing in charge of labor measurement, procedures, schedules, estimating, and costs; J. P. Davey is assistant director for production planning and control. E. P. Riexinger, plant engineer, will be assistant to the director of manufacturing as division plant engineer for new construction, plant engineering, and safety engineering. Frank A. Maley is in charge of purchasing, priorities, and traffic.

Robert Grant has begun duties as vice president in charge of manufacturing at Young Radiator Co., Racine, Wis., producer of heat transfer units for combat planes.

(Continued on page 50)



Wolfe

Jansen

Stocke

Wilson

and has been assigned to the newly organized department of industrial relations.

Leon Wolfe has been appointed quality control engineer of Aeronca Aircraft Corp., Middletown, O., having formerly served as chief of structures.

Charles L. Nielsen has been promoted by Fleetwings Inc. to the position of controller. He will continue to serve as secretary of the Bristol, Pa., firm.

J. E. Hughes, former pilot for the Atlantic Ferry Command, has been appointed to the engineering staff of Adel Precision Products Corp. He has been connected with Curtiss-Wright, Bell Aircraft, Republic Aviation, and Ford Motor Co.



Congratulations to American Aviation for

Distinguished Service to the aviation industry

Delta Air Lines joins in honoring your 5th Anniversary . . . five full years of aggressive service to the welfare and progress of aviation. To the Publisher, Editors, and Staff . . . best wishes . . . May the constructive power of your potent pens continue.

DELTA AIR LINES



AWPC

(Continued from page 45)

action on planning and policy decisions.

Committee members are making regular visits to the member plants to see for themselves the new methods being developed. All innovations are taken back to their own plants for incorporation into established systems.

In cases where specific work requires the attention of a specialist, the committees arrange for a meeting of all specialists engaged in that particular line of endeavor. Their findings subsequently are compiled in a report distributed to each company and placed on file at the council's office at 7046 Hollywood Blvd., Los Angeles.

Chairmen of the seven council committees are:

Committee on production—R. B. Parkhurst, administrator of methods and control, Consolidated; materiel—G. R. Laughlin, chief of materials, Vultee; transportation and housing—R. C. Stormont, manager of the personnel procurement department, Lockheed; engineering and standards—Mac Short, vice-president in charge of engineering, Vega.

Plant defense—Albert M. Gee, director of defense, Ryan; accounting—R. A. Lambeth, vice-president and treasurer, North American; industrial and public relations (industrial relations section)—W. B. Tuttle, director of industrial relations, Vultee; industrial and public relations (public relations section)—A. M. Rochlen, director of industrial and public relations, Douglas.

Manufacturing Digest

CURTISS-WRIGHT Corp.'s Airplane Division, Columbus, O., plant, has released information concerning the Curtiss Seagull SO3C-1 scout-observation. Although the experimental type was announced over a year ago, deliveries of the planes from the Columbus plant have been under way "for some time," but the Navy has withheld release of the news. Powered by an in-line engine, the Seagull is adaptable to wheels or floats and can be based on battleships or cruisers and launched by catapult.

WRIGHT AERONAUTICAL Corp.'s factory at Cincinnati has more than doubled its production of 1,700-hp. Cyclones since Pearl Harbor, it was revealed in mid-May. Company officials said there would be another big boost in output during June when the plant reaches full capacity. The huge factory has been ahead of schedule since it shipped its first engine on June 12, 1941.

FRIGIDAIRE DIVISION, General Motors Corp., Dayton, O., expects to be out of civilian production entirely by June 1. The division is now in production on Browning 50-caliber machine guns, airplane propellers, and aircraft hydraulic equipment.

BENDIX AVIATION Corp. has named Buchanan & Co. Inc. to handle its advertising account. Paul Munroe will be account executive.

BUICK MOTOR Division, General Motors Corp., now a year ahead of schedule in the production of Pratt & Whitney type engines at its Chicago plant, has announced a training program for ground troops of the Army Air Forces designed to produce a supply of trained engine overhaul mechanics.

CESSNA AIRCRAFT Co., Wichita, Kan., through its president, Dwane Wallace, states that more twin-engine bomber pilot trainers have been built in Wichita than the combined output of all other U. S. aircraft manufacturing cities. Wallace reported "important new contracts" for Cessna Bobcats and Cranes, transitional trainers used by the U. S. and British. These and other orders have necessitated the establishment of a "sizeable branch plant 'somewhere in Kansas.'"

AERONCA AIRCRAFT Corp., Middletown, O., reports that L-3-B liaison ships are rolling off the assembly line in "steadily increasing numbers."

EDWARD G. BUDD Manufacturing Co., Philadelphia, is preparing to build an \$8,000,000 aircraft assembly

plant on a new airport site in the northeast section of the city. The plant is expected to employ "several thousand men."

FORD MOTOR Co.'s Willow Run bomber plant, 13½ months after ground was cleared for the project is now in operation. No other details are permitted.

CONSOLIDATED AIRCRAFT Corp. has assigned 26 experts on its staff to teach Army Air Forces mechanic maintenance procedures on B-24s. Initial group of AAF men started training May 18; course covers four weeks; 550 will be given instruction monthly under present plan, but the program may be increased to 1,000 monthly.

REPUBLIC AVIATION Corp., Farmingdale, N. Y., has announced that powered assembly lines for Thunderbolts will be in operation soon. A feature will be the drag-type conveyor with drop hooks in the floor designed to eliminate the need for moving partly constructed planes from one assembly station to another.

BRIGGS MANUFACTURING Co., Detroit, is now in production on aircraft wings; aileron, wing tip, wing flap, stabilizer, fin, rudder, and tail assemblies; bomber turrets; shell cartridge cases; tank hulls; and aircraft engine parts. Employee roll in 1941 reached 23,000. Company holds 15 major war contracts.

EDO AIRCRAFT Corp., College Point, N. Y., through its employees recently presented to the Navy three seaplane floats and a "day's work without pay," amounting to a check for \$9,000.

GOODYEAR TIRE & RUBBER Co., Akron, O., having reduced its sales and field organization over 40% in the last 12 months, is giving its former salesmen an opportunity to join a training school in which they receive a minimum of 85¢ an hour until they are considered fitted for a position in the company's aircraft factories.

PRATT & WHITNEY Aircraft Division of United Aircraft Corp., East Hartford, Conn., broke ground in mid-May for a new plant to be built at Southington, Conn. The factory is said to be one of three to be built by the corporation, the others to be erected at Willimantic, Conn., and East Longmeadow, Mass. Earlier it was revealed that P & W would operate a new DPC plant at Springfield. The Southington unit is expected to be completed by November.

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**Darnell Casters, Wheels
Speed Up Production in
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Every type of caster and wheel
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MANUFACTURING

Weiman Approved

WEIMAN CO., Rockford, Ill., furniture producer, has been approved by the Air Forces Material Division for manufacture of wood parts for aircraft and gliders, as well as ammunition boxes, etc., H. S. Grossman, president, announces. Floor area exceeds 300,000 sq. ft., with employment about 400 in one shift. Company maintains its own plywood department, and reports high speed, precision wood-working machinery. The engineering department is equipped "to lay out for accurate manufacture wooden and plywood plane parts when supplied with proper blueprints and specifications."

Classified Ads

HELP WANTED MALE

Large Government Approved School of Aviation in Middle West wants to get in touch with men 45 or over for positions as Instructors to replace employees who may be called for Selective Service. Two years college science or trade school teaching experience preferred. Applicants without previous instructor experience in Aviation will be required to spend 3 months in preparatory training at this school before salary starts. Write for application blank. Box 343, AMERICAN AVIATION, American Building, Washington, D. C.

WANTED—Flight Instructors with ratings to qualify as flight instructors in Air Force Primary Flying School. Also mechanics and helpers. Hawthorne School of Aeronautics, Orangeburg, S. C.



To Those Who Fight

● America's pledge to those who fight is a pledge of ever-increasing production. Breeze, with all its plants now devoted to production for war, is turning out in quantity high quality Breeze products for service on land, on the sea, and in the air. Today Breeze Shielding, Electrical Connectors, Flexible Conduit and Fittings, and Aircraft Armor Plate, as well as the many other items of Breeze equipment, are giving dependable service on all fronts to those who fight for Democracy.

Breeze

NEWARK, CORPORATIONS INC. NEW JERSEY

Personalities in the News

(Continued from page 47)

J. H. Devins, former public relations and publicity director of J. Stirling Getchell Agency in Detroit, has been appointed director of public relations for Bendix Aviation Corp. **Herbert L. Sharlock**, who previously held the title of director of public relations, has been appointed director of advertising, and will continue this operation at the present company offices in South Bend, Ind.

Harold I. Crow, executive vice president of Air Associates Inc., Bendix, N. J., has been elected president of the company to succeed **F. G. Coburn** who became president last November after the Army took charge of the plant during labor difficulties. Coburn, who remains as a director of the company, said he was accepting a position in "confidential war work."

R. Graham Heiner was elected as a new director of Air Associates.

Eugene W. Norris, formerly chief of the specifications section, Aircraft Engineering Division, CAA, has joined the staff of the technical department of the Aeronautical Chamber of Commerce for full time work on the affairs of the National Aircraft Standards Committee.

K. C. Walkey, formerly with Douglas Aircraft Co. and Intercontinent Aircraft Corp., has been named to the new position of works manager of Spartan Aircraft Co., Tulsa, Okla. **Alfred Reitherman**, formerly with North American Aviation Inc. in Kansas City, Kan., has become assistant to **J. P. Getty**, Spartan president, and **Maxwell W. Balfour**, vice president and general manager. New tool planning supervisor at the Spartan factory is **Harold J. Littleton**. The following Spartan promotions are also announced: **M. H. Vaughn** to factory superintendent; **Archie B. Barnett** to general supervisor in charge of night operations; **Elton H. Rowley** to production engineer; and **Ted W. Wilkins** to chief inspector.

C. W. France, vice president and general manager of Curtiss-Wright Corp.'s Airplane Division at St. Louis, has announced appointment of **J. N. Foster**, plant superintendent, as factory manager to succeed **J. P. Davey**, who becomes assistant director of manufacturing for the Airplane Division. **George M. Ebert**, assistant treasurer of the corporation and comptroller at St. Louis since 1940, has become comptroller of Curtiss-Wright's Propeller Division. **E. F. J. Meyer**, St. Louis public accountant, succeeds Ebert. **George A. Page Jr.**, co-director of engineering for the Airplane Division and chief engineer at St. Louis, has been made director of engineering for the division with headquarters at St. Louis.

Literature Available

WESTINGHOUSE ELECTRIC & Manufacturing Co., East Pittsburgh, Pa.: "Airport Lighting & Distribution Equipment—CAA Approved." A 44-page booklet, glossy stock, with photographs and diagrams of equipment described. Several large diagrammatic maps in back pocket.

UNITED TRANSFORMER Co., 150 Varick St., New York, N. Y.: company catalog featuring 5,000 new designs in transformers. Price list included.

AIR REDUCTION, Advertising Dept., 60 E. 42d St., New York, N. Y.: "Airco in Aviation." A 16-page booklet reviewing the several oxyacetylene flame and electric arc processes which are particularly helpful in accelerating the tempo of aviation production.

FAFNIR BEARING Co., Aircraft Division, New Britain, Conn.: "Handling, Installing and Overhauling Ball Bearings in Aircraft Control Systems." A 16-page booklet to eliminate confusion existing in maintenance shops as to the handling of ball bearings.

CARNEGIE-ILLINOIS Steel Corp., Pittsburgh, Pa.: "Steel Aircraft Materials and Applications." A 76-page booklet containing data on steel parts in various types of aircraft, well illustrated with photographs and diagrams.

BENDIX RADIO, Division of Bendix Aviation Corp., Baltimore, Md.: "The Automatic Radio Compass," by Wilbur L. Webb and Gerald O. Essex. A 30-page explanatory pamphlet, well illustrated with diagrams, photographs, and line drawings.

GUIBERSON AIRCRAFT & Heater Division of Guiberson Diesel Engine Co., Dallas, Tex., announces completion of a plant for production of aircraft sheet metal fabrications.



Buickmen and Test Stand
The Subject: Bomber Engine

CRC

(Continued from page 45)

Company of California; **K. G. Mackenzie**, Texas Co.; and **G. G. Oberfell**, Phillips Petroleum Co.

Chairman of the council is **B. B. Bachman**, and vice chairman is **T. G. Delbridge**.

Headquarters of CRC are at 30 Rockefeller Plaza, New York City.

Airconditioned Shorthand

War forced the world to the air—and brought about a new demand on stenographers.

Consolidated Aircraft Corp. found secretarial help considerably amiss in regard to aircraft terminology, particularly as to shorthand symbols.

To overcome this, Gladys E. Roy, secretary for 14 years to **I. M. Laddon**, vice president and general manager, has started a course in aircraft terminology shorthand at the plant.

AIRCRAFT INSPECTION ENGINEER

To serve as quality control manager.

Must have administrative and directional ability to organize and manage an Inspection Division in an aircraft plant.

Essential to have aircraft and engineering production background.

Will be required to establish a system which will minimize rejections resulting from production methods, tooling and workmanship.

Salary commensurate with ability to produce.

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Latest Earnings Reports

Bendix Aviation Corp.

Earnings amounting to \$3.84 a share on 2,113,353 outstanding shares of capital stock are reported by Bendix Aviation Corp., South Bend, Ind. for the six-month period ended Mar. 31. Net profit for the period, after all charges and after reserve of \$36,261,381 for federal income and excess profits taxes, was \$8,122,679. During the same period in the 1941 fiscal year, when taxes totaled \$8,936,682, net income was \$5,904,862 amounting to \$2.81 a share. These figures include all domestic subsidiaries of the corporation.

Net sales for the period were \$169,633,526, compared with \$56,415,308 for the first half of fiscal 1941.

Square D Co.

Quarterly statement of Square D Co., including Kollsman Instrument Division, shows net profit for the period ended Mar. 31 of \$541,170, equal to \$1.23 a common share. Increased provision for taxes accounts for drop from \$633,670 during the first quarter of 1941. Volume of business was up 80%.

Canadian Airways Ltd.

Canadian Airways Ltd., Winnipeg, Man., net loss for 1941 was \$23,895 compared with loss of \$134,124 in 1940. Operating revenue for the past year amounted to \$1,233,823, and expenses were \$1,094,063. The company, in which control has recently been acquired by Canadian Pacific Railway Co., is operating three schools under the British Commonwealth Air Training Plan in addition to regular flight schedules which have been somewhat revised to effect closer coordination with other new CPR affiliates. Aircraft operated at the end of 1941 totaled 39, compared with 41 at the end of 1940.

The following statistics compare operations in 1941 with 1940:

	1941	1940
Miles flown	2,008,972	2,283,926
Hours flown	18,754	21,764
Passengers carried	25,434	29,759
Mail pounds flown	519,750	627,924
Express pounds flown	6,972,999	5,851,023
Passenger miles	3,311,156	3,513,074
Mail pound miles	94,952,748	101,369,864
Express pound miles	930,586,251	718,393,756

Briggs Mfg. Co.

Briggs Manufacturing Co., Detroit, Mich., indicating influence of conversion to war work, shows net profit for the quarter ended Mar. 31, of \$921,524, or 47c a share on common stock. Profit in the first quarter of 1941 was \$1,816,442, amounting to 93c a share.

W. P. Brown, president, told stockholders that while the company is well ahead of schedule on several of its 15 major war contracts, tooling for complete war production is not yet completed. Outlook for the remainder of the year, he said, depends on how rapidly conversion can be completed and new facilities brought into production. He added that Briggs developments in welding and in the use of mechanical presses for aircraft parts manufacture "will be of service to the entire nation." (See AMERICAN AVIATION, May 15, for company's 1941 annual report.)

Independent Pneumatic

Independent Pneumatic Tool Co. in year ended Dec. 31, had net of \$1,555,005 after depreciation, taxes, etc., equal to \$4.14 each on 375,698 capital shares; 1940 earnings were \$1,205,075, or \$3.21.



8-Ball: Tying in with Donald Nelson's WPB program of one plane every eight minutes, the symbol of a recent Goodyear Aircraft Corp. campaign was the numeral '8.' Newspapers, radio, rallies, billboards, house organs, badges, and banners were used extensively in the promotion of the campaign which was designed to bring the war close to the workers.

Thompson Aircraft Products

Thompson Aircraft Products Co., a non-consolidated subsidiary of Thompson Products Inc., Cleveland, O., lost \$437,771 on sales amounting to \$1,456,143 during the first quarter of 1942. Parent company during the same period showed a net profit of \$130,785 after all charges including loss incurred by the subsidiary. Sales for Thompson Products Inc. were \$12,457,007 compared with sales of \$8,801,801 during the first quarter of 1941.

Statement by F. C. Crawford, president, indicates rapidly increasing production at Thompson Aircraft Products Co., with expectation of profitable operations during the second quarter of 1942.

Globe Aircraft Corp.

Balance sheet for Globe Aircraft Corp., Ft. Worth, Tex., dated Apr. 20, shows total assets of \$984,751 including cash and receivables, \$515,200; inventories totaling \$94,368 including finished airplanes, \$30,367, finished parts \$1,357, work in progress \$44,361, raw materials and stores \$18,282; fixed assets (land, buildings, machinery, and equipment) \$110,701. Other assets include engineering and testing of BTC-1, \$99,806; engineering and testing Swift GC-1, \$60,533; deferred charges and deposits, \$5,468; deferred preparatory expense in connection with AT-10 contract, \$98,672.

Current liabilities of \$637,175 include accounts payable, \$10,143; notes and acceptances payable, \$57,738; due U. S. government for advance payment on contract, \$555,438; deposited by customers, \$5,800; accrued Social Security taxes, \$1,781; accrued payrolls, \$4,305; other current liabilities, \$1,967. Capital stock totals \$350,000, less loss to Mar. 31 of \$2,424 on manufacture of jigs. All other expense items were capitalized as development expense in connections with Air Corps contract.

Aeronca

Aeronca Aircraft Corp. reports earnings for 1941, before provision for federal taxes of \$26,398, were \$115, compared with net of \$30,468, before provision for taxes, in 1940. Net earnings were \$1,710,505 against \$1,006,709 in 1940. All 1941 earnings, with exception of preferred stock dividends, have been reinvested in new buildings, equipment and inventories.

As the result of the greatly increased expansion program, the balance sheet showed considerable changes with assets, Dec. 31, of \$1,041,207 up from \$738,981 in 1940; current assets \$650,131; current liabilities \$455,502; earned surplus plus \$147,827 capital stock \$129,688.

American Export

Annual report for calendar 1941, American Export Lines Inc., includes balance sheet for its 70% owned subsidiary, American Export Airlines Inc., with statement that operation of messenger, express, and mail service between New York and Foynes, Ireland, "will commence within a short time."

Balance sheet as at Dec. 31, 1941 (for Airlines only) shows current assets of \$677,334 (including cash deposits to cover completion payments on new boats); aircraft and miscellaneous equipment \$153,182 (net book value); advance payments on contract to purchase aircraft \$1,766,689; expenses and development costs and expenses \$30,056; expenses in connection with financing through parent company \$948; other assets \$23,319. Total assets \$4,212,530.

Current liabilities were \$165,548; payable to bank (secured by charge mortgage on aircraft and due in monthly installments) \$1,750,000; indebtedness to parent company (subordinated to bank note) \$1,796,982; capital stock (80,000 \$3-par shares issued and outstanding) \$240,000; paid-in surplus \$260,000.

Statement of American Export Lines shows investment in airline subsidiary to include capital stock of \$350,000; notes receivable \$177,850; advance \$1,000,000; and other items \$619,132 totaling \$2,146,982.

Cessna Aircraft Co.

Sales of airplanes, parts and service by Cessna Aircraft Co., Wichita, Kan., totaled \$19,618,031 for the six-month period ended Mar. 31. Operating costs were \$13,401,546; interest payments, fixed asset amortization, etc., \$344,720; provision for warranty and policy expense \$484,500; provision for expense of conversion to peace-time production, \$48,604, leaving net income of \$792,288 after provision for federal and state income taxes of \$4,267,577. This, added to \$90,110 for the preceding period, brings in earned surplus for the past 12 months to \$1,782,399.

Balance sheet as of Mar. 31 shows total assets of \$16,442,974, including cash and marketable securities, \$5,929,797; accounts receivable, \$3,376,513; advance payments to vendors, \$353,386; inventories, \$4,741,840; fixed assets after depreciation, \$1,964,186; deferred charges and prepaid expenses, \$77,250.

Current liabilities included notes payable, \$5,300,000; accounts payable, \$151,267; accrued taxes, \$5,364,542; other accruals, \$200,752; advance on Canadian contracts, \$618,291, for a total of \$11,634,853. Reserves totaling \$1,618,364 include reserve for warranty and policy expense, \$484,500; reserve for conversion to peace-time production, \$404,604; reserve for contingencies, \$729,260. Capital stock and surplus includes common stock \$350,000; paid-in surplus, \$57,357; earned surplus, \$1,782,399.



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Every mile of Delta's essential plane mileage is flown with *Texaco Aviation Gasoline* and *Texaco Aircraft Engine Oil*. Delta's 16-year success with Texaco is another reason why—

More revenue airline miles in the U. S. are flown with Texaco than with any other brand.

The outstanding performance that has made Texaco **FIRST** with the airlines has made it **FIRST** in the fields listed in the panel.

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HELP WIN THE WAR BY RETURNING EMPTY DRUMS PROMPTLY